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FEED THE FUTURE WEST/WINNER

FINAL REPORT

JUNE 2009 – MAY 2014

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ACRONYMS

ACPDD	Association des Citoyens Progressistes pour le Développement de Duvier
ADAIM	Association pour le Développement Agro-Industriel de Mirebalais
ANAP	Agence Nationale des Aires Protégées
AND	Autorité Nationale Désignée
BIA	Boutique d'Intrants Agricoles
BRANA	Brasserie Nationale
CETAI	Centre de Transformation Agro-Industrielle
CHPA	Compagnie Haïtienne de Production Agricole
CIAT	Comité Interministériel d'Aménagement du Territoire
COEPDA	Comité des Organisations Evangéliques pour le Développement Agricole
COPACK/PV	Coopérative des Paysans Chanpyon de Kenscoff/Pétionville
COPACLA	Coopérative des Paysans Chanpyon de la Plaine du Cul de Sac
COPACMA	Coopérative des Paysans Chanpyon des Matheux
COPACMI	Coopérative des Paysans Chanpyon de Mirebalais
COPACSE	Coopérative des Paysans Chanpyon de Saut d'Eau
CRDD	Centre Rural de Développement Durable
DINASA	Distributeurs Nationaux SA
DPC	Direction de la Protection Civile
EMPR	Environmental Mitigation Plan and Report
FDI	Fonds de Développement Industriel
FEDEPAT	Fédération des Producteurs Agricoles de Thomazeau
FEPBSH	Fondation des Pasteurs Bons Samaritains d'Haïti
FTF	Feed the Future
GIKEN	Gilbert Kenol SA
GIS	Geographical Information System
HTG	Haïtian Gourde
INAGHEI	Institut National de Gestion et des Hautes Etudes Internationales
IPM	Integrated Pest Management
KOEPDA	Komité Evangelique pour le Développement Agricole

MARNDR	Ministère de l'Agriculture, des Ressources Naturelles et du Développement Rural
ODEMAR	Organisation pour le Développement Economique de Mahothière
OJEUDEC	Organisation des Jeunes pour le Développement de Célicourt
PERSUAP	Pesticide Evaluation Report and Safer Use Action Plan
RAPCOM	Regwoupman Asosyasyon pou Pwoduksyon ak Komesyalisasyon
REA	Responsable d'Encadrement Agricole
SAPKO	Sosyste Agricol pou Pwoduksyon ak Komesyalisasyon
SOTRAPAL	Société de Transformation des Produits Agricoles
SRI	System of Rice Intensification
USAID	United States Agency for International Development
WIF	Watershed Investment Fund
WINNER	Watershed Initiative for National Natural Environmental Resources

CHAPTER I

OVERVIEW

Vision and Key Principles

The $127 million, five-year, Watershed Initiative for National Natural Environmental Resources (WINNER) started on June 1, 2009, with the following purpose:

> "To implement broad scale investments in sustainable natural resource management at the scale and density needed to produce future positive landscape level reductions in environmental, infrastructural, and economic vulnerability in the Cul de Sac, Cabaret, Gonaives/La Quinte, and other selected watersheds."

The long-term vision of WINNER, as stated in the task order, was clear:

> "People living within targeted watersheds will have improved livelihoods, reduced threat from flooding and have invested in sustainable economic growth and environmental protection in the watershed. Their experience will serve as a model approach to replicate both within and beyond the targeted watersheds."

To achieve this vision, we developed an approach centered on farmers and aimed at reversing the course of economic and environmental decline in targeted watersheds. We thought that if properly assisted, farmers — who have been the main actors of natural resource degradation — can become the driving force behind a revitalization of Haitian watersheds. Our main goal was to help them acquire the resources and capacity to become more productive and generate higher incomes in a sustainable manner that protects the environment. We were also committed to working with the Haitian government at all levels, the private sector, and other stakeholders to reduce threats from flooding, improve and enforce the legal and regulatory framework, and create strong economic links between farmer organizations and private enterprises that will foster new business opportunities and lead to improved livelihoods.

At the beginning, WINNER had four key results:

- Livelihoods of people living in the watershed improved through increased agricultural productivity and alternative income-generation sources
- Critical infrastructure improved and the threat of flooding reduced
- Watershed governance strengthened
- Public-private partnerships established

After the January 12, 2010, devastating earthquake, a fifth key result was added:

- Earthquake recovery enhanced through job creation in rural areas and assistance to small business

In September 2011, per modification to our task order, WINNER became the Feed the Future (FTF)West/WINNER Project, and the initial results framework was changed to include only three key results:

- Agricultural productivity increased
- Watershed stability improved
- Agricultural markets strengthened

Feed the Future West/WINNER was reoriented to focus on five key crops (corn, rice, bean, plantain, and mango) in the Cul de Sac and Matheux corridors. The project implemented an integrated value chain approach to intervene at each stage of value addition, working with thousands of small farmers, to expand production, processing and commercialization of key crops. The project was instructed to spend 80 percent of its resources in support of the target crops, with 20 percent devoted to other crops.

Despite these modifications, the project remained driven by six fundamental principles:

- *Speed and focus*. Intervene rapidly and generate tangible results, while remaining focused on the project's purpose.
- *Impact.* Concentrate efforts and resources where we can maximize impact in terms of risk reduction, food production, and improved livelihoods.
- *Hope and empowerment*. To stop environmental degradation and expanding poverty, provide farmers with enough resources and training to give them hope and a chance to improve their lives.
- *Support for good governance*. Work in partnership with the government and promote compliance with laws and regulations.
- *Productive partnerships*. Foster strong and profitable partnerships between farmers and private enterprises at all stages of value chains to valorize lands, maximize production, and ensure large-scale commercialization.
- *Sustainability.* Strengthen farmer organizations and set up structures and mechanisms that will continue to operate after WINNER ends.

Main Results

WINNER had remarkable results during the five-year period, from 2009 to 2014. The project introduced and disseminated a record number of technical innovations to modernize Haitian agriculture and bolster agricultural productivity while stabilizing hillsides. The main beneficiaries were small farmers grouped into rural associations and cooperatives that were connected to agribusinesses and the government. The following numbers and explanations capture the essence of our main achievements.

Agricultural Productivity Increased

- *119 percent average increase in household income for more than 60,000 farmers assisted by WINNER in targeted areas.* The project went beyond its overall objective: to double farmers' income during a five-year period.

- *More than 300 'Chanpyon" associations and five "Chanpyon" cooperatives, which regroup more than 100,000 farmers, were set up and strengthened.* Chanpyon associations are farmer organizations that have adopted and implement 10 key principles to increase agricultural productivity, protect the environment, and comply with laws and regulations that govern sustainable natural resources management. Chanpyon cooperatives market agricultural products from Chanpyon farmers and associations, under the Chanpyon brand, which is a symbol of good quality and local and healthful products that are grown and packaged using modern, environmentally friendly techniques.

- *18,000 hectares irrigated due to project interventions, in the Matheux and Cul de Sac corridors.* Reliable access to irrigation water is one of the key factors of productivity increase and production expansion. WINNER also helped set up and strengthened water user associations, while working with the Ministry of Agriculture to ensure adequate management and maintenance of the irrigation systems.

- *3,127 master farmers trained to provide extension services in target areas (2,220 men and 907 women).* In the absence of a national extension system managed by the Ministry of Agriculture, master farmers provide proximity technical support to growers and manage model farms that are examples of modern agriculture in their communities. They receive six months of training that include courses on agriculture, environment, management, family planning, nutrition, and specialized themes such as cereals or plantains, vegetable-growing techniques, and soil conservation. At the end of their training cycle, they receive a certificate signed by the Ministries of Agriculture and Environment.

- *15,000 farmers reached by the SMS extension system that provides technical information through biweekly messages, which include topics such as agriculture techniques, availability and price of inputs, and soil preparation services.* Of these, more than 8,000 report using the information on a regular basis.

- *Seven rural centers for sustainable development (CRDDs) established.* CRDDs are training, research, and demonstration centers built by WINNER and managed by local organizations that include representatives of farmer associations, universities, the Ministry of Agriculture and the private sector. They rapidly became strategic centers of agricultural modernization and dialogue among stakeholders, in WINNER zones of intervention, which offer unique services to growers, such as soil and water test laboratories or pest diagnosis and treatment support. CRDDs are also an ideal environment for students and researchers to conduct studies and undertake research activities in many fields. They receive hundreds of visitors every year and attract farmers from all regions of Haiti.

- *17 agricultural input supply stores (BIAs) owned by farmer associations received in-kind grants, as well as managerial and environmental compliance training, so they could provide their communities with pesticides and technical advice that fully respect USAID regulations.* WINNER support resulted in an impressive increase of knowledge and capital among BIAs: the average BIA now has assets worth $80,000. Of the 17 BIAs supported by WINNER, 14 have good potential to be sustainable.

- *More than 30 new technologies or management practices introduced.* WINNER has disseminated an unprecedented array of new techniques, improved seeds, tools, and equipment adapted to Haitian farmers and aimed at increasing productivity, including SRI (System of Rice Intensification), double-row planting for plantains, row planting and higher densities for beans and corn, compost production, hybrid maize and new rice varieties, soil testing and accurate fertilization, conic weeders, motorized threshers, silos, and moisture meters, Even if farmers have rarely adopted all elements of technical packages proposed by the project, they always, for each crop, assimilated and replicated some key practices that led to important yield increases, when combined with adequate access to water and strong extension services.

- *Agricultural productivity increased by 413 percent for corn, 100 percent for beans, 141 percent for rice and 56 percent for plantain.*

- *Watershed stability increased and flood prevention improved.*

- *370 hillside greenhouses built to increase production and stabilize hillsides.* The Greenhouse Revolution promoted protected and vertical agriculture, with drip irrigation, for high-value crops such as vegetables and flowers on hillsides in both corridors. Small farmers belonging to "Chanpyon Organizations" learnt to install small greenhouses with vertical growing systems and made more money on 100 square meters than they usually do on 1 hectare with traditional practices. This innovative technology represents an outstanding technical leap for hillside farming. It also frees space for soil conservation and agro-forestry activities. As a cost-share, each member of beneficiary associations had to plant 50 fruit or forest trees.

- *5,000,000 million seedlings, mostly from fruit trees, were planted, with a survival rate of about 70 percent.* We helped farmer associations set up nurseries and we launched in February 2012 the first large-scale partnership with the private sector to promote agro-forestry initiatives. One million seedlings were sold by WINNER-supported organizations to DINASA and transplanted in target areas located in our zones of intervention.

- *28 ravines were treated with gabions, dry walls, and vetiver and 200,000 cubic meters of sediments were trapped to protect the lives and properties of populations in lower areas of watersheds, and investments were made in productive plains.* Works were implemented by local farmer organizations that acquired the necessary skills to treat those ravines.

- *Eight potable water systems were rehabilitated in the Cul de Sac, Matheux, and Gonaives corridors, for a total of more than 100,000 beneficiaries*. In most cases, we set up management committees for maintenance of these systems.

- *Two important river-widening and bank-strengthening works were completed on the Riviere Grise, near Port au Prince, and la Quinte, near Gonaives for flood prevention.* We installed gabions on sharp river beds and widened the river in critical areas along a 12-kilometer stretch to increase the water capacity to 900 cubic meters per second and protect local populations. We also achieved spectacular results in the la Quinte River, where we widened the banks from 12 meters to 60 meters for 1,800 meters downstream from Pont Gaudin and

built a dyke to raise the flood capacity to 500 m/s, while protecting the water intakes of small farmers. More than 200,000 people were protected, especially during tropical storms Thomas, Isaac, and Sandy.

- *Two early flood warning systems were installed through a participatory approach in the Gonaives and Cul de Sac corridors, in collaboration with government institutions, especially the Direction of Protection Civile, at the Ministry of Interior, to provide increased protection to populations in target areas, in case of natural disasters.*

Good Governance Improved at All Levels

- Seven contingency plans developed for rural communes in WINNER corridors
- Two watershed management plans prepared for the Cul de Sac and Matheux corridors
- One zoning plan developed for the commune of Croix des Bouquets
- Creation of the Designated National Agency for carbon credit
- New draft law on seed production and commercialization
- New draft law on limited liability enterprises in the agricultural sector
- Material and technical support to the Ministry of Environment, the Ministry of Agriculture, CIAT, Bureau des Mines, ANAP, communes of Kenscoff, Petionville, Croix des Bouquets, Ganthier, Thomazeau, Cabaret, Arcahaie, St. Marc, and Gonaives

Commercial Markets Strengthened

- 241 percent increase in the value of mango exports from WINNER-assisted farmers ($509,998 in fiscal year 2013 vs. $149,671 in fiscal year 2011)

- 267 silos installed, helping reduce post-harvest losses by 20 percent due to decreased attacks of products by pests and fungi

- 55 mobile collection centers and 30,000 crates used by farmers to improve post-harvest handling and transportation of mangos and plantains

- Four small processing plants for rice, corn, and sorghum installed by farmer organizations, with technical and material assistance from the project

- More than 10 small enterprises recovered after the earthquake, thanks to the Small Business Recovery Initiative launched by WINNER

- Organization of weekly Farmer's Markets that displayed Chanpyon products sold by WINNER assisted farmers in a modern and healthy environment

Lessons Learned

- Farmers are eager to learn and improve their archaic practices. Most associations recognize that access to irrigation water, inputs, and technical support were the best services offered by

FTF West/WINNER. Visits to CRDD, extension services from young agronomists (REAs) and master farmers, as well as SMS messages, were the most effective ways to disseminate and share technical knowledge. But generally growers complain about a lack of credit, which is a major impediment and prevents farmers from using equipment, inputs, and new techniques introduced by FTF West/WINNER, on a much larger scale.

- Farmers recommend a partnership between the Haitian government, the private sector, and Chanpyon organizations to continue planning and implementing agricultural campaigns in the future. They also highlight the importance of using modern methods for extension services (text messages, demonstration plots, videos, etc.) and empowering public and private institutions to deliver those services.

- Target organizations are sensitive to the need for specific training programs, such as compost production or reduction of post-harvest losses, and request that water-user associations be strengthened for the maintenance of irrigation systems.

- More broadly, farmers are now aware that agriculture can be a source of wealth: 1 hectare, with modern techniques and adequate irrigation, generates more income for a rural household than one year's salary in an urban factory (which is about $1,800 gross and about $1,250 when factoring in transport).

- Haitian agriculture can be competitive. The small size of farms is not an obstacle to good yields, and Haitian farmers can perform as well as any grower in the region.

- Unfortunately, there are few private investments in the agricultural sector and or agribusinesses. Commercial banks that used to allot 10 percent of their portfolio to agriculture 30 years ago, now only allot 1 percent of their loans to agricultural projects.

- There are four key conditions to build on our accomplishments and scale-up the good results of WINNER.

  - Ensure ongoing transfer of modern technology to farmers and provide proximity technical support, in collaboration with the government
  - Give priority to rehabilitation and maintenance of rural infrastructures, especially irrigation systems
  - Support strict enforcement of laws and regulations in rural areas and strengthen state authority
  - Improve access to affordable credit and good-quality inputs

WINNER BY THE NUMBERS

- 119 percent increase in rural household income in targeted areas
- More than 300 farmer associations assisted
- 15,000 hectares irrigated due to project interventions
- 3,127 master farmers trained to provide extension services in target areas
- Seven rural centers for sustainable development (CRDDs) established
- 17 agricultural input supply stores (BIAs) assisted

- More than 30 new technologies or management practices introduced
- 370 greenhouses built to increase production and stabilize hillsides
- 30 percent participation by female beneficiaries
- 50,000 hectares of hillside replanted to prevent erosion
- 5,000,000 seedlings planted for high-value trees
- 200,000 cubic meters of sediments trapped through ravine treatment and soil conservation
- 20,000 cubic meters of new storage capacity installed to reduce post-harvest losses
- Nine agricultural campaigns implemented, including six crops
- Two watershed management plans prepared
- Seven disaster contingency plans prepared
- 15,000 SMS messages sent to farmers to provide market and other information
- One flood early warning system installed in the Cul-de-Sac plain

CHAPTER II

INCREASING AGRICULTURAL PRODUCTIVITY

Sixty percent of Haiti's population depends on the agriculture sector as a source of livelihood. Yet, assessments conducted at the project's inception revealed that productivity levels for key crops were extremely low by international standards. Corn yields in the Cul-de-Sac plain and the Gonaïves/La Quinte area averaged 0.8 tons per hectare in 2009. By comparison, corn yields in Iowa average 9.7 tons per hectare, or 4.5 times the baseline Haitian yields. Recognizing that improving farmers' livelihoods starts with increasing agricultural productivity, USAID and the FTF-West/WINNER project took advantage of the opportunity to work with Haitian farmers in target intervention areas on the key factors that affect productivity: access to high-quality inputs, knowledge of proper technical itineraries, and water.

Improving Access to Inputs

Agricultural input supply stores (BIAs) serve as the main source of seeds, fertilizer, pesticides, herbicides, and tools for Haiti's farmers. Operated by local farmer associations, the stores in the project's areas of intervention needed upgrades and were not accessible to a large number of farmers in these areas. To rectify these issues, the project adopted a two-prong approach: strengthen existing agricultural input supply stores and then work with farmer associations in underserved areas to establish new input supply stores.

Many stores were disorganized and displayed and handled dangerous products in an unsafe manner, sometimes selling hazardous pesticides to farmers. Most store operators were not aware of occupational safety and health issues. Acutely aware of the environmental issues already affecting the country, the project recognized the need for strengthened environmental management, providing training on proper storage and handling of pesticides and fertilizer, occupational safety and health issues, and alternatives to the use of chemical products such as integrated pest management (IPM).

In 2009, the project launched its agricultural campaign activities with the inaugural 2009-2010 winter bean campaign. Through these campaigns, the project facilitated farmers' access to high-quality inputs by issuing in-kind grants to BIAs, providing high-quality seeds, fertilizers, and pesticides. BIAs then sold the inputs to the farmers, building capital in the process. Over time, the subsidies were reduced as BIAs became financially autonomous. Capacity building by the project prepared the farmer associations manage their finances and administrative operations, setting the BIAs up for success.

In 2010, the project embedded Haitian 15 graduate students from the management school (INAGHEI) at the University of Haiti into the BIAs as interns to organize management and accounting systems. This arrangement not only provided the BIAs with much-needed assistance in improving their operations, it also offered local students an opportunity to gain practical experience in their fields of study.

As a result of USAID assistance, the 17 BIAs participating in FTF-West/WINNER activities held an average of $80,000 in assets. The project realized an 80 percent success rate in preparing

BIAs for sustainability based on increased financial reserves and capacity building. Further success will depend on the engagement of the Haitian government through much-needed legislation regulating seeds and revised fertilizer subsidization policies, which currently result in severe shortages despite high demand by farmers.

In addition to assisting BIAs with providing improved seeds and inputs to farmers in target areas, the FTF West/WINNER project also worked with the Ministry of Agriculture on preparation of a draft law on seeds to provide a regulatory framework for certification of high-quality seeds. The draft law is still being reviewed by the Ministry of Agriculture before being submitted to Parliament.

To promote good environmental stewardship, the project trained 35 people on integrated pest management in May 2013. Staff from the BIAs supported by WINNER were among the IPM trainees. The purpose of this training was to demonstrate alternative techniques to the use of chemical pesticides and herbicides for pest control.

Instilling Good Agricultural Practices

Sustainability of project activities depended on knowledge transfer and preparing farmers with the information and skills necessary to carry on the successful agricultural practices they learned through FTF-West/WINNER's activities. Imparting knowledge of good agricultural practices was a cornerstone of the project's approach to improving agricultural production.

Demonstration and training centers. In the course of the project, Feed the Future West/WINNER established seven *Centres Ruraux de Développement Durable* (CRDDs). The CRDDs serve as centers of demonstration, learning, applied research, and proximity extension services for farmers in the project's zones of intervention. Composed of a model farm and training center — and in some cases, laboratories for soil and water testing and greenhouses —the CRDDs underline the importance of knowledge transfer, exposing farmers to modern agricultural techniques (such as vertical agriculture using greenhouses). Demonstration plots provide farmers with the opportunity to witness first-hand the differences between modern technical itineraries and traditional practices.

MAP with Locations of CRDDs

- Bas Boen CRDD in the Cul-de-Sac plain
- Kenscoff CRDD in the Cul-de-Sac hillsides
- Duvier satellite CRDD in hillside areas of Petionville
- Montrouis CRDD in the Matheux (St. Marc) corridor productive plains
- Goyavier satellite CRDD
- Tarasse CRDD in the Gonaives plain
- La Branle CRDD in the Gonaives hillsides

Demonstration plots. Subscribing to the adage that "seeing is believing," the FTF-West/WINNER project created demonstration plots throughout its areas of intervention to encourage farmers to adopt more efficient technical itineraries and farm management practices. The project offered farmers real-time opportunities to compare crops grown using the improved technical itineraries introduced by FTF-West/WINNER to the same crops grown using traditional practices. At harvest time, farmers witnessed first-hand the differences in yields and quality of the products. The demonstration plots played an essential role in fostering changes in agricultural practices and the adoption of the prescribed technical itineraries, including the system of rice intensification (SRI) introduced by the project in 2010. Previously skeptical farmers could see for themselves the vast improvement in yields through the demonstration plots.

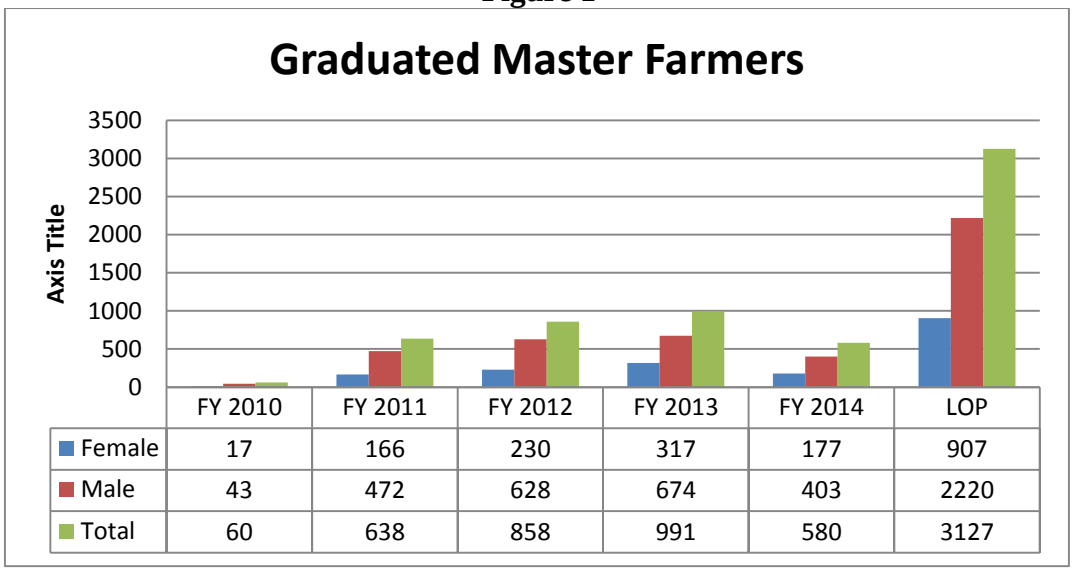
Master farmers certification. Launched in 2009, the project's Master Farmers training program offers intensive training to local farmers on a robust curriculum. Once certified, Master Farmers were expected to share their newly acquired knowledge with others in their communities to expand the adoption of more efficient and sustainable agricultural practices. Each participant (who was nominated by his or her farmer association) completed four mandatory courses (basic agricultural principles, small farm management, sustainable environmental management, and family planning), plus two specialization courses, such as vegetable production, cereals production, soil conservation, livestock management, greenhouses, and SRI. Graduates were awarded a certificate signed jointly by the Ministry of Agriculture, the Ministry of Environment, and the project, as well as a kit of the tools needed to provide extension services to other farmers. By project completion, 3,127 Master Farmers successfully graduated from the program, including 907 women (29 percent).

Table 1. Graduated Master Farmers by Region

Region	Female	Male	Total
Cul de Sac plain	332	802	1,134
Kenscoff	237	396	633
Matheux	200	597	797

Gonaïves	67	295	362
Mirebalais	71	130	201
Total	**907**	**2,220**	**3,127**

Figure 1



In addition to the master farmers training program, FTF West/WINNER also provided long term training opportunities through the provision of scholarships to eight Haitian graduate students that attended the University of Florida and successfully graduated. All of these students, who completed theses relevant for agriculture and agribusiness in Haiti, are back in the country and productively engaged. Also, training was provided for disaster preparedness, use of silos and post-harvest equipment, and financial management of input supply stores (BIAs).

The project also entered into a partnership with five universities to assist Haitian agronomy students with field research projects at the CRDDs. Students received assistance in conducting applied research as part of their university requirements.

The significant wealth of field research findings from students and from CRDD experiments have been captured in a document entitled "Agricultural field research undertaken under Feed the Future West/WINNER" that summarizes all the key findings. This document has been shared with the Ministry of Agriculture, key agricultural universities in Haiti, and is at the CRDDs.

Introducing appropriate technologies

The introduction of appropriate technologies and management practices was critical to increasing yields. In the productive plains of the Cul de Sac and the Matheux (St. Marc) corridors, mechanized soil preparation with tractors was important in enabling large areas of land to be ploughed in time for the planting season. The FTF-West/WINNER project made 20 tractors available to the CRDDs of the plains and to selected farmer associations to provide soil preparation services to local farmers. The tractor operators participated in training courses on the proper operation of the machines and sound environmental management.

The introduction of the system of rice intensification (SRI) proved to be one of the most successful activities undertaken by FTF-West/WINNER. This system, first introduced in Madagascar, allows rice farmers to increase yields while using fewer seeds and fertilizer. The principles of SRI include appropriate spacing between plants, early transplantation of young shoots, one plant per pocket, the use of just enough water for irrigation to keep soil moisture, and proper weed control.

Through SRI, the plants grow more vigorously and yields increase significantly. To build on these results, the project also introduced appropriate tools for use with SRI, such as roller markers to pinpoint the plantation points, conical weeders to control weeds between rows of rice plants, and a deep urea placement machine to apply appropriate quantities of fertilizer directly to the root system of the plants.

In addition to the SRI technique, FTF West/WINNER introduced appropriate technologies that help further increase rice production including roller markers to properly space rice plantation pockets; conical weeders that allow farmers to better control weeds growing between the rice shoots; and a urea deep placement device that allows for a more efficient use of fertilizer by injecting urea pallets in the root system of the rice plants.

For all of the project's target crops, FTF West/WINNER introduced improved management practices through the implementation of efficient technical itineraries. These itineraries included proper soil preparation, planting, weeding, fertilizer application, pest control, harvest and post-harvest operations.

Assisting farmers with extension services

In the 1980s, the Haitian Ministry of Agriculture stopped providing extension services for farmers. As a result, many farmers did not have access to the latest information regarding technical and management advances in best agricultural practices. To encourage the adoption of modern and efficient technical itineraries, FTF-West/WINNER engaged young agronomists as extension agents. These extension agents (called Responsables d'Encadement Agricole, or REAs) worked directly with farmers in the project's areas of intervention, providing advice and monitoring the progress of the planting season in conjunction with the project's agricultural campaigns.

Providing access to water

In 2009, the FTF-West/WINNER project began rehabilitating the irrigation systems of the Cul-de-Sac and Gonaïves plains, which had fallen into disrepair due to neglect and lack of investment. Access to water was essential to increase agricultural productivity and to revive agricultural lands that were lying fallow, and with the return of water to the plans, farmers immediately began preparing their land for the winter bean season.

In the course of the five years, the FTF-West/WINNER project has rehabilitated irrigation systems in the Cul-de-Sac, Gonaïves, and Matheux productive plains, allowing farmers to continue participation in subsequent agricultural campaigns. In addition, the project also rehabilitated pumping systems of the Cul-de-Sac and Gonaïves plains, – 17 pumps in Cul-de-Sac

alone – and the Bas Boen power generation plan that provides alternative energy to these pumps. By project completion, the rehabilitation of irrigation systems was responsible for expansion of agricultural production to 18,000 hectares of previously fallow land in productive plains, allowing farmers to produce multiple crops per year and increase their incomes.

Despite the successful rehabilitation and expansion of irrigation canals, these networks constantly face threats of flooding and natural disasters. Hurricane Sandy in 2012, which destroyed the canal intakes of the Rivière Grise and Rivière Blanche irrigation systems in the Cul-de-Sac plain serves as an illustrative example. Mobilizing quickly, the FTF-West/WINNER team repaired the intakes and cleared the obstructed irrigation canals to ensure farmers' continued access to water. This process did not offer a permanent solution, as rehabilitation and repairs were frequently called for following heavy rains. In February 2014, the project launched the construction of a permanent water diversion dam on the Rivière Grise in collaboration with its partner CH2M Hill and the Government of Haiti Upon completion in January 2015, the Rivière Grise dam will ensure that water flows permanently into the Cul-de-Sac plain, ensuring continued agricultural production and a sustainable solution.

In order to ensure the maintenance of the rehabilitated irrigation systems of the rivière Grise, the FTF West/WINNER project helped create the Association des Irriguants de la Rivière Grise (AIRG), a water users association made up of farmers in the irrigation perimeter. WINNER provided capacity building to AIRG so that the organization could collect fees from members and maintain secondary and tertiary canals, with the responsibility for the maintenance of primary canals being borne by the Ministry of Agriculture. The project also worked with local water users associations in the Matheux corridor to improve irrigation system maintenance.

The productive plains of Haiti are subject to flooding from major weather events. This was the case with hurricane Jeanne in 2004 and hurricanes Ike and Hanna in 2008 that devastated Gonaïves, and by Hurricane Sandy which caused significant damage to the Cul-de-Sac plain in 2012. In order to reduce the risk of flooding in productive plains, the project undertook major

infrastructure projects to widen the La Quinte river in Gonaives and the Grise river in the Cul-de-Sac and to strengthen their banks. In the Matheux corridor, FTF West/WINNER consolidated the banks of the Bretelle, Torcelle, and Courjolle rivers to protect irrigation systems.

What's preventing Haiti's farmers from maximizing their yields?

Despite the incredible achievements under FTF-West/WINNER, there remain hurdles to overcome before the full potential of improved yields is reached.

Access to credit. Many farmers do not have the financial resources to pay for the timely purchase of high quality inputs, soil preparation services, or labor during the planting season.

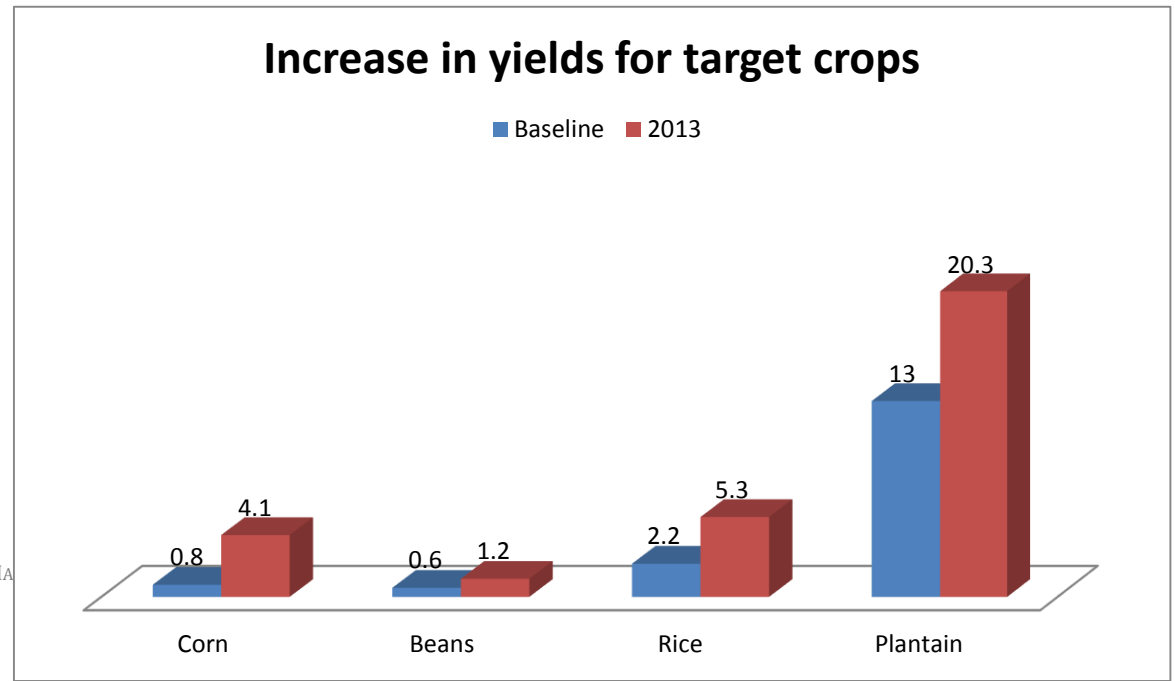
Access to water. Reliable access to water is critical to ensure that crops are adequately irrigated. When irrigation intakes are washed out or pumps for the aquifer system are dysfunctional, water stress results in sub-optimal crop yields.

Lack of labor. Farmers may face labor shortages at some critical times during the crop production cycle, often when family labor is not sufficient or in certain peri-urban areas with labor shortages due to competition from urban jobs.

Farmer reluctance. Some farmers blame the additional effort involved in the application of some technical itineraries as a reason for their sub-optimal application. For example, SRI requires more labor for planting and weeding. When machines such as roller markers or conical weeders are not available, some farmers are reluctant to invest in the additional effort necessary to properly apply SRI's technical itinerary.

Results and impact

The impact of project efforts to increase agricultural productivity in its areas of intervention is undeniable. Over the course of five year, farm yields improved dramatically for all crops, increasing five-fold in some cases: bean yields increased by 100 percent; corn yields by 413 percent; rice yields by 141 percent; and plantains by 56 percent. On demonstration plots, where the project controlled the full application of the prescribed technical itineraries and ensured optimal application, yields increased even more: beans by 142 percent; corn by 550 percent; rice by 218 percent; and plantains by 146 percent. These differences in results between the controlled plantings and those of beneficiary farmers illustrate the potential for continuing improvement for



farmer adopting the technical itineraries to the fullest extent. Full implementation, however, is dependent on the removal of certain obstacles that currently limit the results of these itineraries.

In the course of the project, FTF West/WINNER supported the implementation of nine agricultural campaigns in its areas of intervention. Table 2 summarizes the results of these campaigns.

Table 2. Summary of agricultural campaigns supported by FTF West/WINNER

Agricultural campaign	Crops	Region	# of hectares assisted	# of farmers assisted
Winter 2009	Beans	Cul de Sac plain	971	1,432
Spring 2010	Corn Sorghum Beans	Cul de Sac plain	1,846	2,721
		Kenscoff	1,378	1,566
		Mirebalais	1,596	2,014
		Matheux	2,370	1,749
		Gonaïves	1,987	2,534
		Total	**9,177**	**10,954**
Winter 2010	Beans	Cul de Sac plain	700	939
		Matheux	487	336
		Mirebalais	725	1,003
		Total	**1,912**	**2,278**
Spring 2011	Beans Corn Sorghum Rice Potatoes Plantain	Cul de Sac plain	2,921	1,962
		CDS hillsides	751	1,050
		Matheux	1,605	2,810
		Mirebalais	1,859	2,928
		Total	**7,135**	**8,750**
Winter 2011	Beans	Cul de Sac plain	2,284	2,213
		Matheux	522	843
		Total	**2,806**	**2,966**
Spring 2012	Beans Corn Rice Plantain	Cul de Sac plain	4,330	4,246
		Matheux	1,053	1,211
		Total	**5,383**	**5,457**
Winter 2012	Beans	Cul de Sac	1,911	2,888
		Matheux	425	688
		Total	**2,336**	**3,576**
Spring 2013	Beans Corn Rice Plantain	Cul de Sac	2,729	3,562
		Matheux	1,416	2,333
		Total	**4,145**	**5,895**
Winter 2013	Beans Plantain Rice	Cul de Sac	565	666
		Matheux	301	564

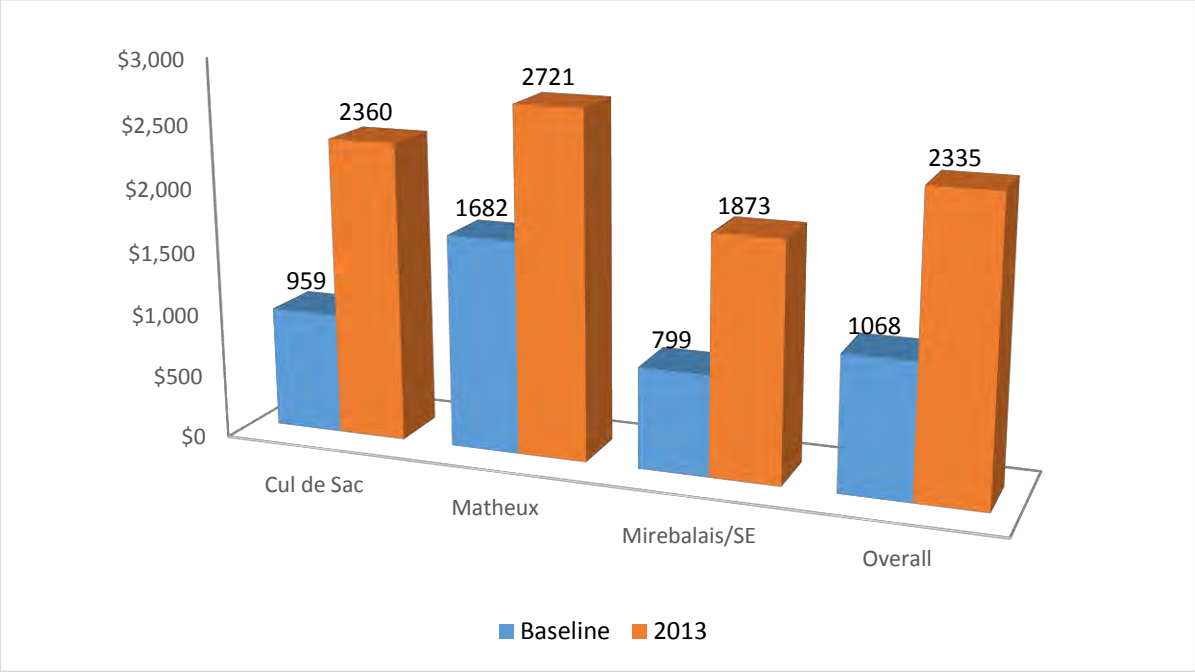
Agricultural campaign	Crops	Region	# of hectares assisted	# of farmers assisted
		Total	**866**	**1,230**

Increase in household income

A key result of the FTF West/WINNER program has been the increase in household income of farmers. In the Fall of 2009, we conducted an assessment of the rural economy in the initial zones of intervention of the Cul-de-Sac and the Gonaïves/La Quinte watersheds. The average household income from farming activities was $959 in the Cul de Sac and $1,087 in Gonaïves. In 2010, two further baseline assessments were conducted for the Matheux corridor and the Mirebalais/Saut d'Eau region. From these assessments, the average rural household income from farm activities was $1,682 in the Matheux and $799 in Mirebalais/Saut d'Eau.

In 2013, FTF West/WINNER conducted a survey of rural households that received assistance from the project in the Cul-de-Sac and Matheux corridors, and in the Mirebalais/Saut d'Eau region. From this survey, the average household farm income in the project's areas of intervention was $2,360 in the Cul-de-Sac corridor, $2,721 in the Matheux corridor, and $1,873 in Mirebalais/Saut d'Eau. Using a weighted average based on the number of farmer associations supported by the project in each area, we estimate that the average household income for FTF West/WINNER beneficiaries jumped from $1,068 in the baseline to $2,335 in 2013 (an increase of 119 percent). Figure 3 below illustrates the increase in household income.

Figure 3. Increase in average rural household income in target areas ($)



Farm sale increases for target crops

The activities undertaken by FTF West/WINNER to increase agricultural productivity have resulted in farm sale increases for target crops. The value of incremental sales measures how farm sales have increased for target crops in the project's areas of intervention. Table 3 below summarizes the increase in the value of sales from the baseline (2009 for beans, rice and corn; and 2011 for plantain) to 2013.

Table 3 Increase in the value of sales for target crops

Crop	Value of sales in the baseline ($)	Value of sales in FY 13 ($)	Value of incremental sales ($)
Beans	$286,658	$7,247,671	$6,961,013
Corn	$278,727	$2,170,760	$1,892,033
Rice	$372,900	$2,854,417	$2,481,517
Plantain	$3,874,958	$4,708,091	$833,133
Total	**$4,813,243**	**$16,980,939**	**$12,167,696**

Because the project increased the number of farmers it reached over time, a more meaningful measure is the increase is sales per farmer. Table 4 presents the increase in sales per farmer for target crops. On average, the value of sales increased by 80 percent for farmers supported by FTF West/WINNER.

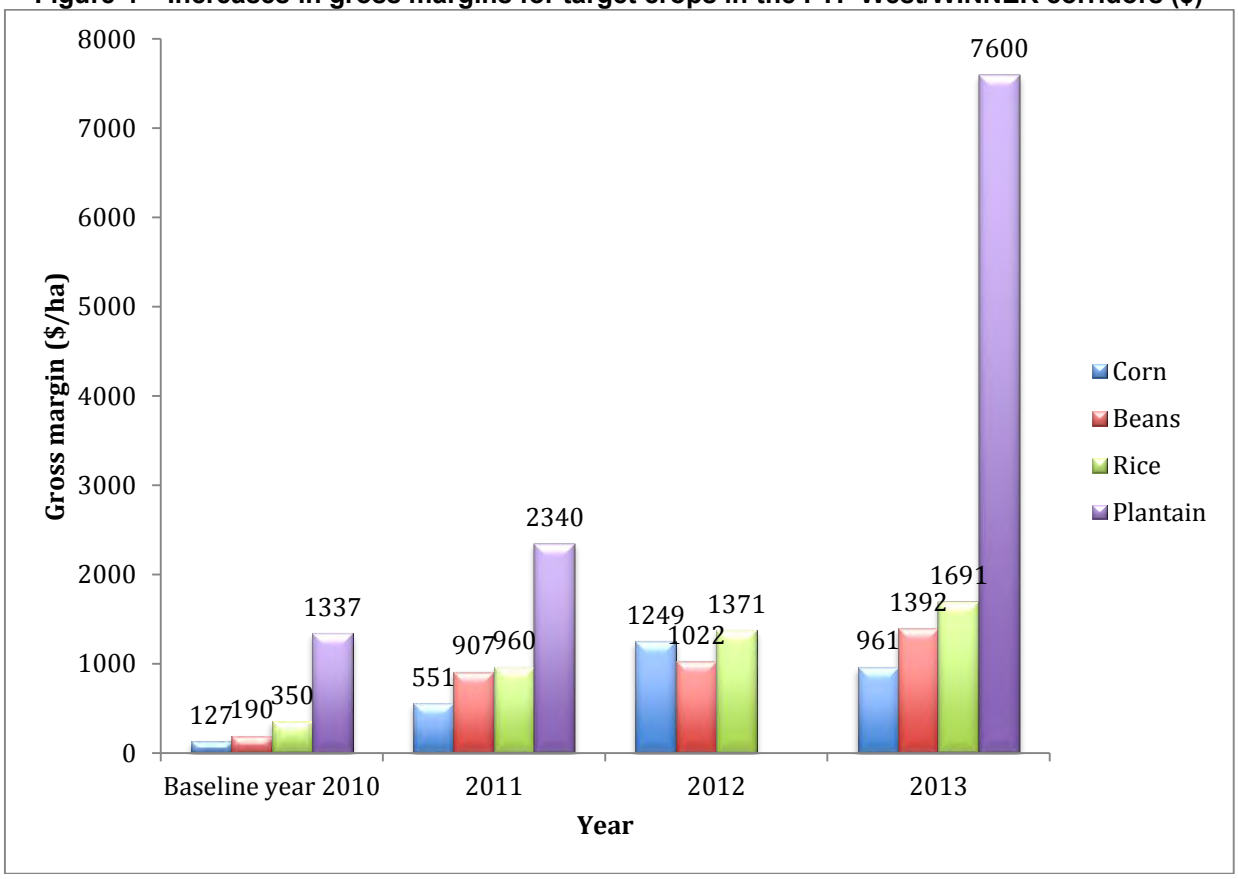
Table 4. Increase in the value of sales per farmer

Crop	Value of sale per farmer (baseline)	Value of sales per farmer (FY 13)	% increase in the value of sales per farmer
Beans	$731	$1,381	89%
Corn	$391	$1,010	158%
Rice	$1,486	$2,385	61%
Plantain	$4,703	$5,368	14%

Gross margin increases for target crops

We use the 2009 baseline gross margin per hectare for corn, beans, rice, and plantain from Agro Consult study and the obtained gross margin per hectare of the mentioned crops during fiscal years 2010 to 2013 in the two WINNER corridors. Figure 4 displays the progress of gross margins for corn, beans, rice and plantain from 2010 to 2013 in the WINNER corridors. In general, gross margins per hectare for targeted crops have steadily increased from the baseline up to 2013 fiscal year except for corn where in 2013 the gross margin got a slight decrease from 883 percent increase to 657 percent one (Figure 5). Farmers were compelled to lower their prices to be able to sell their corn at competitive market prices due to low prices of imported corn. Figures 5 through 8 show that gross margin for corn, beans, rice and plantain have steadily increased from the baseline 2010 to 2013 by 657 percent, 633 percent, 468 percent and 657 percent respectively.

Figure 4 – Increases in gross margins for target crops in the FTF West/WINNER corridors ($)



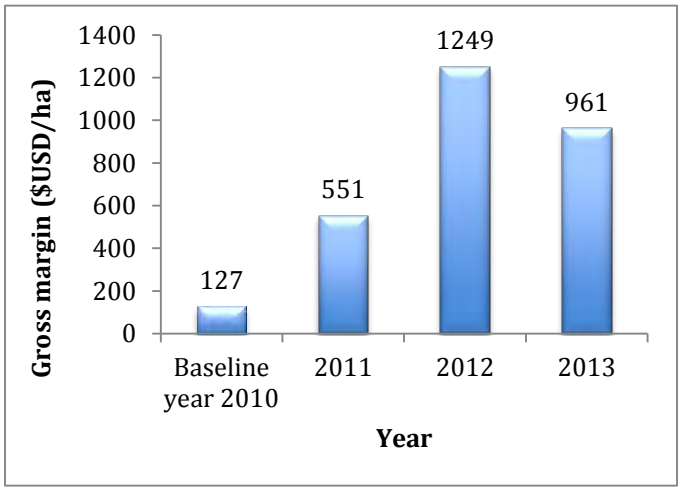


Figure 5. Progress of gross margin for corn in the for beans in WINNER corridors from 2010-2013 2010-2013.

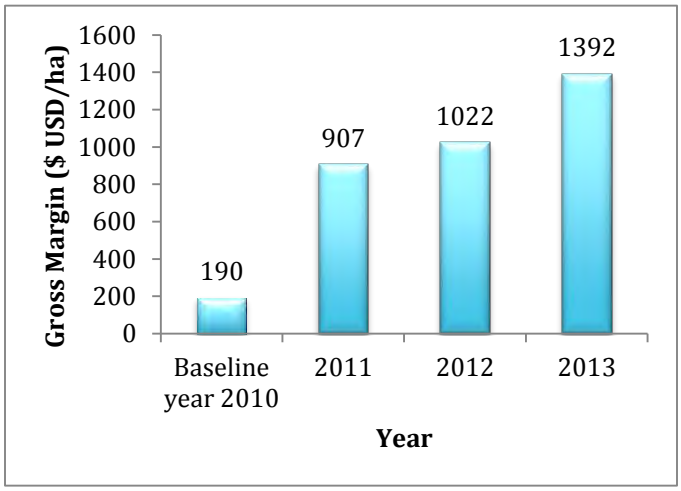


Figure 6. Progress of gross margin the WINNER corridors from

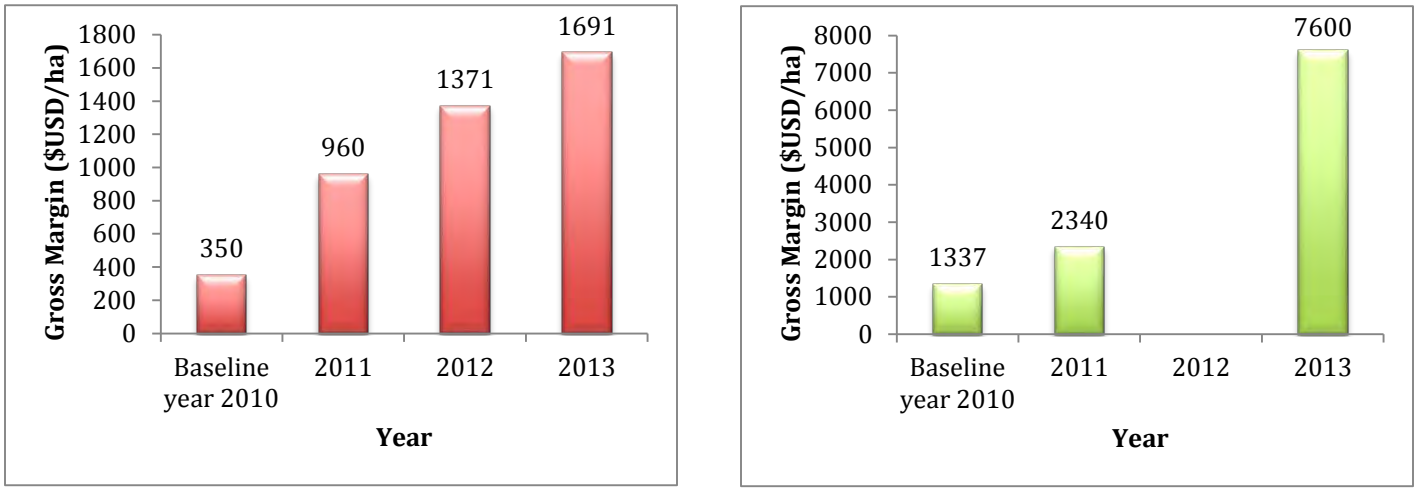


Figure 8. Progress of gross margin for plantain in the Matheux corridor

CHAPTER III

STABILIZING HAITI'S HILLSIDES

Decades of poor agricultural practices and deforestation have left Haiti's hillsides badly eroded, leading to reduced soil productivity and greater threats of flooding downstream. To address this problem, FTF-West/WINNER developed a sustainable approach that relied on the stabilization of hillsides through ravine treatment and soil conservation measures; the implementation of sustainable hillside agricultural practices; increased tree cover through agro-forestry; and improved governance.

Sustainable hillside agriculture

One of the keys to protecting the productive plains is to develop sustainable models for hillside agriculture upstream. Haiti is a very mountainous country and many farmers practice subsistence agriculture on hillsides. Often times, Haitian hillside farmers engage in unsustainable agricultural practices such as planting crops on steep slopes and not allowing sufficient time between crop cycles. Combined with rapid deforestation, these agricultural practices exacerbate the already severe erosion problems the country faces.
FTF West/WINNER worked with farmers of the hillside areas of its target zones of intervention to help them move towards more sustainable and profitable agricultural practices. The project implemented 4 hillside CRDDs where best practices are demonstrated (Kenscoff, Duvier, Goyavier, and La Branle). The Kenscoff CRDD is the main hillside CRDD built under WINNER.

The Kenscoff CRDD was inaugurated on January 24th, 2013 on the site of the Wynne Farm Ecological Reserve. The center is managed by the Wynne Foundation to ensure the long-term sustainability of the training and demonstration programs. The center works to promote effective linkages between farmers, local authorities, the Ministry of Agriculture, and agri-businesses operating in the Kenscoff and Petionville hillsides. The CRDD has seven greenhouses currently being used for cut flower production and demonstration purposes. The Kenscoff CRDD provides training to farmers in the region and demonstrates best practices of sustainable hillside agriculture.

The CRDD is recognized for increasing famer access to innovative agricultural technologies, particularly related to greenhouse establishment and maintenance. The CRDD maintains extensive demonstration plots that are used for training farmers and also sold as produce. The building on the CRDD plot includes office space and a spacious training room. In addition, the Kenscoff CRDD provides land preparation services with rotary tillers.

The Greenhouse Revolution

Faced with the challenge of rehabilitating fragile hillsides that were subject to severe erosion, the project introduced Haitian farmers to hillside greenhouses, which served as the cornerstone for the project's vertical agriculture activities. These greenhouses, the first of their kind in Haiti, eliminated the need for farmers to clear entire hillsides to make way for their crops. Despite their small footprint, greenhouses dramatically increased the yields – and revenues – that some Haitian farmers realized with their harvests. One greenhouse occupies only 70m^2, yet can support the production of high-value crops much more efficiently than production on steep slopes in open field. Greenhouse production, which protects crops from pests and inclement weather, also offered the opportunity to complete up to three harvests per year; traditional farming only permits up to two harvests at most. By the time activities ended, FTF-West/WINNER had helped farmers erect 370 greenhouses in its zones of intervention. Some farmers associations have been able to reinvest the funds generated by greenhouse crops to

What is vertical agriculture?
Vertical agriculture is the practice of arranging flower and vegetable pots in a stacked configuration. Every greenhouse is equipped with a drip irrigation system to service each stack of pots. This technique, introduced for the first time to Haiti by the FTF-West/WINNER project allows farmers to plant "vertically," significantly reducing the need for surface area. Because construction of greenhouse requires little to no clearing of the land, they are ideal for hillside crop production.

purchase additional greenhouses at their own expense or through partnerships with other organizations. Greenhouses introduced by FTF West/WINNER have been used in the hillsides of the Cul-de-Sac and the Matheux corridors to produce flowers and high value vegetable crops. However, while the greenhouse program was fully implemented in hillside areas of Kenscoff and Petionville by farmer associations such as Solidarité Haïtienne pour le Développement de Kenscoff and APFCK, the greenhouses installed in the Matheux corridor were able to demonstrate a technology that has significant potential, but for which farmers require further training in construction, maintenance, and water management.

Reforestation of Haiti's fragile hillsides

Since 2010, FTF West/WINNER organized agro-forestry campaigns. Working with community-based organizations in the hillside areas of its zones of intervention, the project set up nurseries; distributed seeds and materials to associations so that they could produce tree seedlings; and organized the associations for the transplantation of trees. The agro-forestry campaigns were organized in order to make bulk purchases of inputs based on the needs expressed by farmers, with a prevalence of fruit trees and income-generating forest tree species.

Table 5 below presents a summary of the agro-forestry campaigns implemented by FTF West/WINNER from 2010 to 2013.

Since the inception of the project, 334 nurseries have been established and nearly 5 million tree seedlings have been transplanted covering an area of close to 33,000 hectares. Table 34 below presents the overall results of the ago-forestry campaigns conducted by FTF West/WINNER since the beginning of the project.

Table 5. Overall results of the FTF West/WINNER agro-forestry campaigns

Region	Number of nurseries	Number of local organizations involved	Tree seedlings transplanted	Surface area planted (hectares)	Number of beneficiaries
2009- 2010 campaign					
Matheux	12	12	105,452	787	11,947
Gonaïves	27	27	578,578	4,316	3.119
Kenscoff/Petionville	63	19	545,547	4,070	26,486
Mirebalais/Saut d'Eau	27	72	353,757	2,639	1,709
Cul-de-Sac plain	4	1	247,563	1,847	843
Subtotal	133	131	1,830,897	13,658	44,104
2011-2012 campaign					
Matheux	15	15	110,452	824	12,235
Gonaïves	27	27	432,908	3,229	3,119
Kenscoff/Petionville	69	69	578,929	4,319	26,486
Mirebalais/Saut d'Eau	18	18	400,797	2,990	1,709
Cul-de-Sac plain	1	1	110,540	825	843
Subtotal	130	130	1,633,626	12,187	44,392
2012-2013 campaign					
Matheux	22	20	405,085	2,030	1,250
Kenscoff/Petionville	31	22	400,330	1,877	1,768
Mirebalais/Saut d'Eau	6	6	48,374	310	673
Cul-de-Sac plain	12	12	611,236	2,781	3,601
Subtotal	71	60	1,465,025	6,997	7,292
Grand Total	**197(*)**	**184(*)**	**4,929,548**	**33,842**	**50,000(*)**

(*) There is overlap in the totals for these data points across campaigns.

In addition to the agro-forestry campaigns organized by FTF West/WINNER, one million trees were also planted on 814 hectares, as part of a partnership with DINASA called "Plante Lavni" in the project's areas of intervention.

The total area planted with trees as a result of FTF West/WINNER interventions is summarized in Table 6 below. Overall, 34,656 hectares were planted with fruit and forest trees in upper watershed areas of the Cul-de-Sac, Matheux, Mirebalais/Saut d'Eau and Gonaïves.

Table 6. Surface area planted with trees as a result of FTF West/WINNER (hectares)

Zone	Area planted with trees (hectares)
Cul de Sac hillsides	16,988
Matheux	4,184
Mirebalais/Saut d'Eau	5,939
Gonaives	7,545
Total	**34,656**

Ravine treatment and soil conservation

FTF West/WINNER implemented ravine treatment and soil conservation activities since 2010. Overall, 28 priority ravines were treated in the project's zones of intervention. The ravines to be treated were prioritized based on their potential threats to the productive plains downstream. The ravine treatment and soil conservation program included the installation of gabions and drywalls along the ravines, the plantation of trees around the ravines, and the installation of vetiver grass strips. We estimate that 218,000 m^3 of sediments have been trapped by the treated ravines and that 582 hectares of hillsides have been stabilized based on the length of the ravines treated and the areas adjacent to the ravines that have been stabilized with tree planting, vetiver installation and other soil conservation techniques. On average, 143.5 meters of treated ravines corresponds to one hectare of hillsides stabilized. Table 7below summarizes the ravine treatment and soil conservation activities undertaken by FTF West/WINNER.

Table 7. Area Stabilized by Ravine Treatment and Soil Conservation Activities

Year	# of projects	Quantity of sediments trapped (m^3)	# of trees planted	# of vetiver plants installed	Gabions and drywalls installed (m^3)	Length of treated ravines (m)	Area stabilized (ha)
FY 11	17	4,896			11,712	6,374	44.4
FY 12	25	164,300	280,569	2,632,500	62,565	36,300	253.0
FY 13	13	43,798	133,600	1,651,250	19,558	33,640	234.4
FY 14	1	5,565	11,850	132,725	4,212	7,245	50.5
Total	**44(*)**	**218,559**	**426,019**	**4,416,475**	**98,047**	**83,559**	**582.3**

(*) Some projects are carried across years

Activities in the mango value chain

Since being tasked with intervening in the mango value chain in 2011, the FTF West/WINNER project undertook several activities to alleviate some of the constraints in the value chain.

The FTF West/WINNER project provided assistance to farmer associations in setting up mango nurseries in the areas of Mirebalais, Saut d'Eau, and the Matheux corridor. The project also provided training to farmers on grafting mango francisque with other mango varieties; and on pruning mango trees to increase production. Finally, the project worked on the transplantation of mango trees as part of its agro-forestry campaigns. Overall, about 550,000 mango tree seedlings were transplanted from 2011 to 2013 in the project's areas of intervention.

CHAPTER IV

STRENGTHENING AGRICULTURAL MARKETS

FTF-West/WINNER recognized that improving the lives of Haitians must be done through a holistic approach. The impact of increased agricultural productivity is not fully realized if farmers do not have outlets for their products. As such, the project's first two components were complemented by a third: remove barriers to accessing agricultural markets. To achieve this goal, the project simultaneous addressed three types of obstacles that hindered farmers' market access – obstructed physical access due to poor quality transportation infrastructure; limited access to information; and minimal access to consumers.

Getting from the farm to the market

Haiti's roads serve as a major artery for rural farmers in accessing larger rural markets and urban centers, but they had fallen into severe disrepair, making the journey difficult (if not impossible) for local farmers. Those that did succeed in getting their products into the urban areas were often left with bruised and damaged produce – greatly impacting the prices that farmers could ask for the fruits and vegetables they had toiled to grow and transport to market. The FTF West/WINNER project launched a road rehabilitation program starting in 2010. The project rehabilitated the Fonds Baptiste road in the Matheux corridor and completed detailed studies and bid documents for major rural roads in the Cul de Sac plain (Dumay, Merceron, Cottin) and in the Matheux corridor (Bretelle-Cazale and Robert-Delice).

Access to information

To complement its extension services and the guidance provided by project REAs, FTF-West/WINNER also relied on technology to reach farmers. To increase farmers' access market information, the project implemented the "Koze Payzan" program, which provided beneficiaries with bi-weekly SMS messages in Creole that addressed topics such as proper plantation techniques, availability and price of inputs, and soil preparation services. By project end, 15,000 SMS messages were sent to 8,000 farmers to provide advice and share market information.

Establishing the "Asosyasyon Chanpyon" brand

The FTF-West/WINNER project aggregated nearly 100,000 small producers into five regional cooperatives in the Cul-d e-Sac plain, the Matheux corridor, Kenscoff, Mireblais, and Saut d'Eau – legally recognized entities positioned to work with financial institutions to scale up

Béliard Miracle, a farmer in Kenscoff, had limited access to markets, and earned only $1,000/year for his harvests. Now, after collaborating with FTF-West/WINNER, he brings in three times that amount each month as part of the Asosyasyon Chanpyon, Organization for the Economic Development of Mahotiere (ODEMAR).
"The contact that I have with distributors is the best thing that has ever happened to me," he says The training provided by the project allowed Béliard to distinguish himself as a leader and agricultural entrepreneur, and he is now the first president of the Cooperative of the Asosyasyon Chanpyon of Kenscoff.

business. Working as a larger cooperative, rather than individual farmer associations, participants established partnerships with the private sector, including supermarkets, hotels, resorts, and restaurants. The Chanpyon label designates a certain commercial quality of agricultural products and sound environmental practices. As a member of certified Asosyasyon Chanpyon organizations, farmers gain increased access to markets by collaborating with fellow members, learn how to improve production techniques, and contribute to the commercialization of products in their region. The project conducted intensive capacity building programs on administrative, financial and accounting management, as well as marketing and legal guidance, to strengthen participant's knowledge of the laws that govern their businesses.

The Asosyasyon Chanpyon were aggregated into five cooperatives (COPACLA, COPACMA, COPACK/PV, COPACMI, and COPACSE) that have legal status and are able to achieve economies of scale in the purchase of inputs and to assist smallholders with the commercialization and distribution of their products on a large scale. The cooperatives received office and transportation equipment as part of their capacity building. The aggregation of smallholders is key to developing more efficient value chains and distribution channels.

Thanks to the farmers' market, seemingly simple activities, such as using weight scales and offering receipts, have impacted the perception of buyers. Traditionally, supermarkets were the only vendors using these measurement techniques, and as such, they appeared as a more "legitimate" choice for consumers despite charging a higher price for the similar, imported products. However, thanks to the creation of a reliable local brand, *Asosyasyon Chanpyon*, buyers can now confidently purchase high quality, locally grown products, increasing food security and income for Haiti's poorest families. Désilia Jean, a farmer from Thomazeau, agrees: "Before, I had difficulties selling my produce. Now, I earn more money and don't let go of my products for a cheap price."

Improved market practices

In 2012, the project launched the "Mache Peyizan," initiative around the Port-au-Prince metropolitan zone to improve market practices and link producers directly to consumers. The project organized bi-monthly markets with the participation of famers associations from the Cul-de-Sac and Matheux corridors, generating over $200,000 in sales. Farmers from Asosyasyon Chanpyon, the FTF-West/WINNER champion cooperatives, transport goods to these markets to be sold locally. The linkage to these local markets allows farmers to compete with larger grocery stores by providing local quality products, and less expensive options directly to the consumer.

Strengthening public-private-producer partnerships

By fostering marketing of agricultural products by Haiti's farmers, FTF-West/WINNER supported the development of lasting partnerships between the Asosyasyon Chanpyon cooperatives and the private sector. These partnerships, which directly connect farmers to large agro-industrial businesses, have remained a focal point of FTF-West/WINNER since its

inception. Linking the producer organizations to the private sector, the project paved the way for greater distribution and processing of agricultural products including maize, rice, plantains, beans, mangoes, sorghum, flowers and vegetables. In 2012, The Cooperative des Paysans Chanpyon de la Plaine du Cul-de-Sac (COPACPLA), comprised of 124 farmer associations, signed a milestone contract with Compagnie Haitienne de Production Agricole (CHPA) for the sale of black and red beans amounting to more than US $2 million. Later that year, the Fondation des Pasteurs Bons Samaritains d'Haiti (FEPBSH) signed a contract with the Brasserie Nationale S.A. (BRANA) for the sale of 200 metric tons of sorghum to produce Malta H, a popular energy drink in Haiti. Sorghum sold to BRANA represents revenues of $80,000 to association members. BRANA pays $400/ton for the sorghum from FEPBSH. This price per ton represents a US $200 - $220 increase from the usual price for local sorghum.

The sale of sorghum to BRANA to produce the energy drink, Malta H, represents $8,000 per year to farmer Cadet Luckner alone. "I was proud to see that our sorghum was of such a high quality that a large brewery like BRANA would want to buy our product!"
In 2012, Mr. Luckner was only able to provide jobs for 8 people in his community. In 2013, he was able to employ 24 people thanks to the partnership with BRANA.

"The funniest thing, and I consider this a revelation, is that I had some land and I never knew its importance and value until I crossed the path of the FTF-West/WINNER project. Before, we never knew where we were going to sell our

In a novel form of partnership, the company GIKEN entered into a joint venture with two farmer associations of the Cul-de-Sac plain (OJEUDEC and ACPDD) to create SOTRAPAL, which produces energy drinks and dried soup mixes using local products grown in the Cul de Sac plain.

FTF West/WINNER supported the implementation of the CETAI processing center in Mirebalais. This center will eventually be used for sorting beans and for producing plantain and potato chips. In FY 2014, the project provided two silos, two generators and two inverters with all accessories. CETAI secured financing from the FDI to build the processing facility and acquired the land. This equipment grant will allow the cooperative of Matheux farmer associations "COPACMA" to hold about 8 percent of the shares in the corporation CETAI Arcahaie S.A.

Also in FY 2014, FTF West/WINNER supported the implementation of an industrial greenhouse of 2000m^2 for the foundation ARN based in Digue – Matheux in the Arcahaie area. An memorandum of understanding was signed by ARN, Men Kontre (a group of farmer associations) and FTF West/WINNER. This project seeks to ensure agriculture development in Digue – Matheux using greenhouse technology and to disseminate this knowledge to the local population in order to generate income. The installation of the ARN industrial greenhouse was completed in March 2014.
For the processing of mangos, the project help set up a dried mango processing unit in Mirebalais in a partnership between the ADAIM farmer association and Delicious Fruits SA (a dried fruit processing firm). However, this partnership was not successful and the ADAIM facility is now managed by Mon Pays Ma Cuisine, a private company specialized in the distribution of quality local products.

Reducing post-harvest losses

Starting in 2011, FTF West/WINNER provided post-harvest equipment to farmers in all target crops. The project distributed two types of post-harvest equipment.

1. For mangos and plantain, FTF West/WINNER provided farmers with mobile collection centers and crates. In addition, the project introduced innovative donkey pack frames to transport mangos from the production areas to aggregation points.

2. For beans, corn, and rice, the project provided farmers with silos, tarps, humidity gauges, and packaging materials.

Mangos and plantain

To reduce post-harvest losses for mangos and plantain, FTF West/WINNER provided the following equipment to mango producers:

Mobile collection centers. These centers consist of tents and sorting tables. They protect recently harvested mangos from excessive sun and the sorting tables allow for export-ready mangos (of the

right size and without blemish) to be separated from others.
Crates. Plastic crates prevent the crushing and bruising of mangos during transport. They also provide aeration and are an efficient way to transport fresh produce.

Water drums allow for fruit washing before they are placed into crates.

Pack frames. This innovative technique, developed at the University of Florida, allows the transportation of mangos on the backs of donkeys from mango producing areas inaccessible to vehicles. Crates are placed in the pack frame.

Table 8 provides a summary of the post-harvest equipment provided by FTF West/WINNER to mango and plantain farmers.

Table 8
Post-harvest equipment provides to mango and plantain farmers

Year	Mobile collection centers	Crates	Water drums	Donkey pack frames
FY 2012	38	9,800	76	-
FY 2013	2,753	1,575	-	78
Total	2,791	11,375	76	78

Beans, corn and rice

For beans, corn and rice that can be stored for long periods after harvest, the FTF West/WINNER project supported farmer associations with the following post-harvest equipment:

Tarps are used to place the products after harvest so that they are not laid directly on the ground where they can be contaminated by worms and affected by moisture.

Silos are very useful to store non-perishable agricultural products. The silos provided by the project are mobile and can easily be installed close to production areas, they are elevated to protect products from pests and rodents, they are hermetic to prevent moisture from affecting the products, and they are easy to assemble. With the use of silos, farmers are able to store grains that can be sold throughout the year are more interesting prices than immediately after harvest.

Humidity gauges allow farmers to control the humidity conditions inside the silos to monitor that the storage conditions are appropriate. Farmers were trained on how to use the gauges and on the acceptable humidity levels for each target crop (i.e., beans, corn and rice).

Jute bags are used to transport beans and corn in a more efficient way. They protect the products

from deterioration when it changes hands.

Table 9 presents a summary of the post-harvest equipment provided to farmers producing beans, corn and rice in FTF West/WINNER's areas of intervention. This equipment was provided to 59 associations regrouping 30,521 members.

Table 9
Post-harvest equipment provided to beans, corn, and rice farmers

Year	Tarps	Silos	Humidity gauges	Jute bags	Crates
FY 2012	3,060	70	70	-	-
FY 2013	6,553	53	53	6,275	660
Total	9,593	123	123	6,275	660

Estimated post-harvest loss reduction

Post harvest losses in the mango value chain

In the mango value chain, we have precise estimates of the reduction in post-harvest losses. At the start of FTF West/WINNER, the association of mango exporters ANEM estimated at 25 percent the rejection rate of mangos at exporters' facilities. That is, one in four mangos provided by producer associations was not paid for because the fruit was not exportable.

Table 10 presents a summary of the reduction in rejection rates at exporters' facilities of the mangos provided by farmer associations receiving support from FTF West/WINNER. Overall the mango rejection rate was reduced from 25 percent to 16.3 percent. This is due to the post-harvest equipment and training provided by the project.

Table 10
Reduction in the mango rejection rates due to FTF West/WINNER interventions

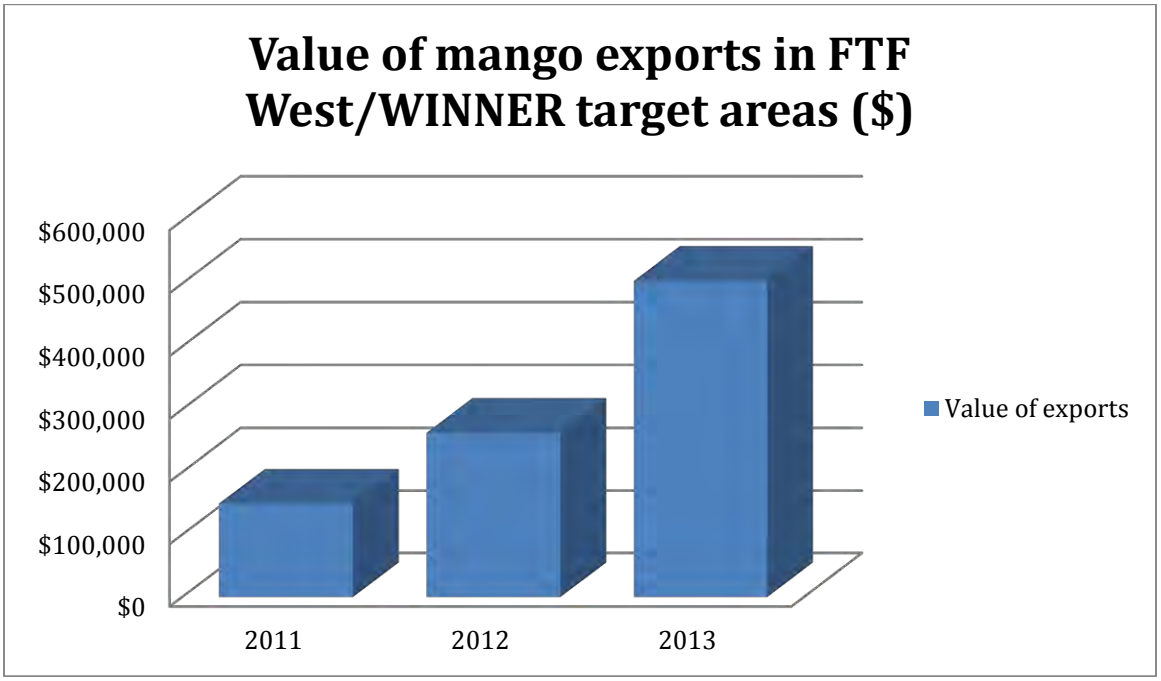
Quantity of mangos purchased by associations (2011- 2013)	Quantity of mangos sold to exporters (2011 – 2013)	Rejection rate	Baseline rejection rate (2010)
3,549,394	2,969,134	16.3%	25%

Source: Data from ANEM (Association Nationales des Exportateurs de Mangues)

Impact on exports

The value of mango exports from producer associations supported by the project was $149,671 in 2011; $262,472 in 2012; and $504,169 in 2013. Figure 9 below presents the estimated increase in the value of exports due to the FTF West/WINNER project.

Figure 9 Value of mango exports attributable to FTF West/WINNER



Other effects

The project hired local firm Solutions SA to implement a pilot project for the traceability of mangos and plantain. The traceability system used GIS and cell phone technology to track the origin of mangos sold to exporters and uses a zip code system to identify areas of production. This traceability system has been presented to the Ministry of Agriculture and, if adopted, will constitute a major step forward in modernizing the Haitian mango value chain.

Improving governance

Just as important as solidifying farmer support and enthusiasm for project activities is garnering buy-in from the Government of Haiti, from the national level to the communal. Every step of the way, FTF-West/WINNER worked with government counterparts to design and implement activities in line with the GOH's development goals and vision. Through these partnerships, government bodies can build on the momentum of the project to ensure sustainability and continual advancement of the Haitian agricultural sector.

In the course of implementing project activities, FTF West/WINNER worked with institutions of the Government of Haiti at the national, regional, and local levels.

At the national level, the project engaged with Ministries on policy issues. The project helped the Ministry of agriculture draft a law on seeds in order to provide a regulatory framework for the development of a certified seed industry in Haiti. FTF West/WINNER helped draft the decree for the creation of the Designated National Authority within the Ministry of Environment. This is a necessary step for Haiti to be eligible to receive financing for carbon credits under the Clean Development Mechanism under the Kyoto Protocol on Global Climate Change.

FTF West/WINNER worked closely with the Comité Interministériel d'Aménagement du Territoire (CIAT) on land use planning issues, particularly on the preparation of the watershed management plans for the Cul-de-Sac and Matheux corridors. These watershed management plans provide a blueprint to the Haitian Government for addressing zoning issues and the balance between the needs for agricultural development, urban expansion, and the protection of natural resources.

At the regional level, the project prepared seven communal disaster contingency plans for the communes of Kenscoff, Croix des Bouquets, Thomazeau, Ganthier, Tabarre, Arcahaie, and St Marc. Along with the contingency plans, FTF West/WINNER worked with the Direction de la Protection Civile to set up local Civil Protection Committees to improve disaster preparedness. In addition to providing capacity building and materials to staff at numerous government facilities, the project worked with communal governments to complete GIS mapping of watersheds.

CHAPTER V

REBUILDING POST-EARTHQUAKE HAITI

The FTF West/WINNER project had just celebrated its six-month anniversary when Haiti was hit by one of the most catastrophic earthquakes in history on January 12, 2010. Although project relief efforts were not originally envisioned as a key component in the Haiti FTF West/WINNER intervention, the project nimbly adapted its activities in the earthquake's immediate aftermath, and within days it began implementing activities to begin the process of getting Haiti back on its feet under the Accelerated Earthquake Recovery Program.

In the days following the earthquake, food, water, and shelter were the most pressing concerns. In response, the Haiti FTF West/WINNER project distributed tarps, mattresses, food and clean water to displaced Haitians throughout its areas of intervention.

The project also launched a "cash for work" program to clean and rehabilitate irrigation canals in its areas of intervention. This activity served a two-fold purpose. First, to create jobs for Haitians whose livelihoods had been disrupted by the earthquake, and secondly to help prepare for the spring/summer 2010 agricultural campaign and enhance food security in the country. The project employed 20,000 people in order to carry out it these activities. The Ministry of Agriculture and USAID signed a memorandum of understanding to launch the 2010 agricultural campaign in the Cul-de-Sac plain, Gonaives, and the Matheux (St Marc) corridor. This partnership enabled local staple crops to be grown to feed Haitian affected and displaced by the earthquake.

POST-EARTHQUAKE ASSISTANCE

- Food and water distributed to 25,000 people in Peguyville, Petionville, Cul-de-Sac and Kenscoff.
- 20,000 people employed in Work for Recovery Program
- 659 km of irrigation and canals cleaned
- 10 SMEs rebuilt their businesses thanks to the SBRI program
- 200 gas cookstoves distributed to street food vendors

With immediate relief activities well underway, the project conducted a comprehensive assessment of losses to the private sector as a result of the earthquake, employing precision GIS mapping with key information on damaged enterprises and the business district. The results were staggering: private sector losses (excluding banks and insurances) amounted to US $2.1 billion – or 30 percent of Haiti GDP. In response, the project launched the Small Business Recovery Initiative (SBRI) to provide grants and facilitate access to affordable credit for small and medium enterprises (SMEs) affected by the earthquake. Providing financial assistance to 10 SMEs linked to the agricultural sector – including bakeries, food depots, distilleries, and repair shops – the project was able to leverage additional funding from financial institutions to help re-launch businesses that has been affected by the disaster.

Finally, FTF West/WINNER provided street food vendors of Petionville and Croix des Bouquets with gas cookstoves in order to reduce the use of wood charcoal in a pilot project through which 200 gas stoves were distributed. This successful pilot led to the development of a more substantial activity financed by USAID.

CHAPTER VI

MONITORING AND EVALUATION

This section presents the results achieved and progress made towards FTF West/WINNER project indicators during the life of the project. Table 11 presents a summary of progress towards key indicators.

Table 11. Summary of Progress Towards Key Indicators

Indicator #	Indicator	Baseline	FY 10 target	FY 10 actual	FY 11 target	FY 11 actual	FY 12 target	FY 12 actual	FY 13 target	FY 13 actual	FY 14 target	FY 14 actual	LOP target	LOP actual
4.5-16 F & FtF outcome	Gross margin per unit of land, kilogram, or animal of selected product (crops/animals/fisheries selected varies by country)	Corn: $127 Beans: $190 Rice: $350 Plantain: $1,317	Corn: NA Beans: NA Rice: NA Plantain: NA	Corn: $127 Beans: $190 Rice: $350 Plantain: $1,317	Corn: NA Beans: NA Rice: NA Plantain: NA	Corn: $551 Beans: $907 Rice: $960 Plantain: $2,340	Corn: $760 Beans: $1,104 Rice: $1,311 Plantain: $3,048	Corn: $1,249 Beans: $1,022 Rice: $1,371 Plantain: NA	Corn: $1,260 Beans: $1,200 Rice: $1,450 Plantain: $5,600	Corn: $961 Beans: $1,392 Rice: $1,691 Plantain: $7,600	Corn: NA Beans: $1,260 Rice: $1,522 Plantain: $5,880	Corn: NA Beans: $852 Rice: $1,610 Plantain: $7,593	Corn: $1,260 Beans: $1,260 Rice: $1,522 Plantain: $5,880	Corn: $1,260 Beans: $1,392 Rice: $1,610 Plantain: $7,593
Outcome	% increase in yield per hectare in the targeted corridors	NA	NA	NA	NA	Corn: 367% Beans: 88% Rice: 118% Plantain: 126%	Corn: 399% Beans: 111% Rice: 129% Plantain: 154%	Corn: 399% Beans: 111% Rice: 129% Plantain: NA	Corn: 448% Beans: 132% Rice: 141% Plantain: 131%	Corn: 448% Beans: 95% Rice: 139% Plantain: 56%	Corn: NA Beans: 144% Rice: 150% Plantain: 85%	Corn: NA Beans: 105 % Rice: % Plantain: 92%	Corn: 448% Beans: 144% Rice: 150% Plantain: 85%	Corn: 448% Beans: 132% Rice: 141% Plantain: 92%
Outcome	Yield per hectare in the target corridors	Corn: 708 Beans: 568 Rice: 2,200 Plantain: 13,000	NA	NA	Corn: NA Beans: NA Rice: NA Plantain: NA	Corn: 3,304 Beans: 1,069 Rice: 4,800 Plantain: 29,400	Corn: 3,530 Beans:1,200 Rice: 5,030 Plantain: 33,000	Corn: 3,530 Beans: 1,200 Rice: 5,030 Plantain: NA	Corn: 3,880 Beans: 1,320 Rice: 5.300 Plantain: 30,000	Corn: 3,880 Beans: 1,110 Rice: 5,260 Plantain: 20,300	Corn: NA Beans: 1,386 Rice: 5,500 Plantain: 24,000	Corn: NA Beans: 1,165 Rice: Plantain: 25,000	Corn: 3,880 Beans: 1,386 Rice: 5,500 Plantain: 24,000	Corn: 3,880 Beans: 1,200 Rice: 5,300 Plantain: 25,000
PL11	Percent change in value of international exports of targeted agricultural commodities as a result of USG assistance				0%	0%	25%	75.4%	120%	240%	131%	119%	131%	234%
4.5.2.36 FTF	Value of exports of targeted commodities as a result of USG assistance	$2.37 M (2011) Adjusted to $149,671	NA	NA	NA	$149,671	$2.97 M Adjusted to $187,088	$262,472	$330,000	$509,998	$346,500	$328,000	$346,500	$500,000
4.5.2.2 FTF	Number of (l) hectares under improved technologies or management practices as a result of USG assistance					10,001		Total: 14,838 New: 4,838 Cont: 10,000	Total: 14,500 New: 4,500 Cont: 10,000	Total: 17,230 New: 5,230 Cont: 12,000	Total: 13,000 New: 1,000 Cont: 12,000	Total: 12,552 New: 552 Cont: 12,000	Total: 13,000 New: 552 Cont: 12,000	Total: 12,552 New: 552 Cont: 12,000
4.5.2.4 F	Number of agriculture-related firms benefitting directly from USG-supported interventions	NA = 0	5	7	10	2	4	2	4	3	0	0	15	14
4.5.2.39 FTF	Number of technologies or management practices in one of the following phases of	NA	NA	11	5	21	4	4	6	5	2	2	17	41

Indicator #	Indicator	Baseline	FY 10 target	FY 10 actual	FY 11 target	FY 11 actual	FY 12 target	FY 12 actual	FY 13 target	FY 13 actual	FY 14 target	FY 14 actual	LOP target	LOP actual
	development: • *…in Phase I*: under research as a result of USG assistance • *…in Phase II*: under field testing as a result of USG assistance *…in Phase III*: made available for transfer as a result of USG assistance													
4.5.2.5 FTF	Number of farmers and others who have applied new technologies or management practices as a result of USG assistance	NA = 0	5,000	12,076	10,000	9,786	10,00	11,648	10,000 M: 6,000 F:4,000 New:2,000 Cont:8,000	16,274 New: 8,274 Cont: 8,000	16,168 M:8,310 F:7,858 New:500 Cont: 15,668	16,527 New:859 Cont: 15,668	16,168 M:8,310 F:7,858	16,527 New:859 Cont: 15,668
4.5.2.6 FTF	Number of individuals who have received USG supported long-term agricultural sector productivity or food security training	NA = 0					NA	T; 33 M: 24 F: 9	T; 40 M: 25 F: 15	T; 26 M: 23 F: 3	0	0	T: 40 M: F: 9	T; 33 M: 24 F: 9
4.5.2.7 FTF	Number of individuals who have received USG supported short-term agricultural sector productivity or food security training	NA = 0	500	246	2,450	1,136 890 new	1,500	3,218 2,082 new	T; 1500 M: 1,050 F: 450	T: 2,299 M: 1,581 F: 718	T; 1,000 M: 700 F: 300	T:580 M:403 F:177	T:3,500 M: 2,200 F: 1,300	T:6,097 M:4,333 F:1,764
PL #	Number of master farmers trained	NA = 0	NA	T: 60 M: 43 F: 17	NA	T: 638 M: 472 F: 166	NA	T: 858 M: 628 F: 230	NA	T: 991 M: 674 F: 317		T: 580 M: 403 F: 177	T: 3,000 M: 2,300 F: 700	T: 3,127 M:2,220 F: 907
PL1	Number of hectares of hillsides protected thanks to USG interventions	NA = 0	NA	NA	NA	9,327	4,500	4,446	3,500	6,997	0	0	20,000	20,770
PL2	Volume of soil preserved in upper watershed areas	NA = 0	NA	NA	NA	NA	NA	164,300	165,000	208,098	50,000	10,461	200,000	218,559
PL3 BSC	Number of kilometers of mechanical structures built/rehabilitated	NA = 0	NA	39	NA	7	80	36.3	60	118.1	10	0	150	161
PL	Volume of mechanical structures built/rehabilitated	NA = 0	NA	NA	NA	NA	NA		NA		NA	98,047	NA	98,047
PL4	Number of policies and land use regulations implemented	NA = 0	NA	1	NA	0	1	0	4 2 new 2 continuing	4 2 new 2 continuing	6 0 new 6 continuing	6 0 new 6 continuing	6	6 0 new 6 continuing
PL5	Number of sub-watershed management bodies formed and strengthened	NA = 0	NA	NA	NA	NA	4	1	4 (5)	2	2	1	4	4
PL6	Number of hectares covered with high value tree crops (fruit trees and noble forest wood) with	NA = 0	NA	NA	NA	9,283	11,190	4,166	4,000	T; 5,598 Fruit: 3,152 Forest:	0	15,642	30,000	T; 34,646 Fruit: 19,407 Forest:

Indicator #	Indicator	Baseline	FY 10 target	FY 10 actual	FY 11 target	FY 11 actual	FY 12 target	FY 12 actual	FY 13 target	FY 13 actual	FY 14 target	FY 14 actual	LOP target	LOP actual
	project assistance									2,446				15,249
PL	Number of trees planted	NA = 0	NA	732,359	NA	1,098,538	NA	1,633,626	NA	1,465,025	NA	0	NA	4,929,548
PL	% survival rate of trees planted	NA = 0	NA	50%	NA	55%	NA	65%	NA	70.9%	NA	NA	NA	70.9%
4.8.1.1 (replaces PL7)	Number of hectares of biological significance and/or natural resources showing improved physical conditions as a result of USG assistance	0	150	0	50	44	0	0	1,000	0	0	0	1,200	44
4.8.1.26 (Replaces 4.8.1.4)	Number of hectares of biological significance and/or natural resources under improved natural resource management as a result of USG assistance	NA = 0	200	11,884	400	8,033 Bio areas: 0 Other areas: 8,033	T: 4,500 Bio areas: 200 Other areas: 4,300	4,413 Bio areas: 0 Other areas: 4,413	2,500 Bio areas: 1,500 Other areas: 1,000	T: 7,598 Fruit trees: 3,152 Forest trees: 2,446 Parc la Visite: 2,000	500	1,914	8,000	33,842
4.8.2-26 F	Number of stakeholders with increased capacity to adapt to the impacts of climate variability and change as a result of USG assistance	NA = 0	NA	NA	NA	NA	NA	301,950	100,000	240,000	100,000	100,000	100,000	541,950
Cust 4.8.1.5	Number of people receiving USG supported training in natural resources management and/or biodiversity conservation	NA = 0	T: 1,000 M: 600 F: 400	T: 1,341 M: 809 F: 532	T: 1,000 M: 600 F: 400	T: 1,234 M: 922 F: 312	T: 1,500 M: 1,050 F: 450	T: 1,232 M: 875 F: 357	T: 1,200 M: 840 F: 360	T: 1,548 M: 1,018 F: 530	T: 100 M: 70 F: 30	T: 115 M: 80 F: 35	T: 2,000 M: 1,300 F: 700	T: 5,470 M: 3,704 F: 1,766
4.8.1.6 F	Number of people with increased economic benefits derived from sustainable natural resource management and conservation as a result of USG assistance	NA = 0	T: 1,500	T:53,189 M:31,913 F:21,276	T: 7,237	T: 2,468 M: 2,018 F: 450	T: 1,250 M: 875 F: 375	T: 60 M: 38 F: 22	T: 3,960 M: 2,772 F: 1,188	T: 3,960 M: 2,772 F: 1,188	T: 200 M: 140 F: 60	T: 950 M:570 F: 380	T: 50,000 M: 30,000 F: 20,000	T:60,827 M: 37,311 F: 23,516
4.5.2.23 FTF	Value of incremental sales attributed to FTF implementation or Value of farm sales	NA = 0	4,813,253	7,090,000	NA	T:7,090,000 Corn: 3,069,000 Beans: 3,121,000 Rice: 9000,000	T: 9,576,000 Corn: 3,489,000 Beans: 3,316,000 Rice: 1,650,000 Plantain: 1,121,000	T: 7,585,594 Corn: 2,840,093 Beans: 4,041,006 Rice: 704,495 Plantain: -	T: 13,756,451 Corn: 1,125,042 Beans: 6,258,036 Rice: 4,721,273 Plantain: 1,652,100	T: 12,876,873 Corn: 1,932,802 Beans: 6,961,012 Rice: 2,316,517 Plantain: 1,666,542	T: 6,125,042 Corn: - Beans: 3,000,000 Rice: 1,000,000 Plantain: 2,125,042	T: 5,838,025 Corn: - Beans: 1,043,098 Rice: 2,247,271 Plantain: 2,547,271	T: 13,756,451 Corn: 1,125,042 Beans: 6,258,036 Rice: 4,721,273 Plantain: 1,652,100	T: 12,876,873 Corn: 1,932,802 Beans: 6,961,012 Rice: 2,316,517 Plantain: 1,666,542
4.5.2.38 FTF	Value of new private sector investments in the agricultural sector and food chain leveraged by FTF implementation.	NA = 0	NA	NA	NA	767,500	800,000	1,086,114	2,000,000	4,028,394	0	1,435,207	5,000,000	7,317,215

Indicator #	Indicator	Baseline	FY 10 target	FY 10 actual	FY 11 target	FY 11 actual	FY 12 target	FY 12 actual	FY 13 target	FY 13 actual	FY 14 target	FY 14 actual	LOP target	LOP actual
4.5.2.29 F	Value of agricultural and Rural loans	NA = 0	NA	NA	NA	0	500,000	550,000	500,000	100,000	500,000	550,000	1,000,000	1,200,000
4.5-5 FTF	Total increase in installed storage capacity (m3)	NA = 0	NA	NA	NA	NA	NA	NA	500	1,183	500	348	1,000	1,531
PL8	Value of Ag Business Sales (post harvest operations (including storage – processing and packaging)	NA = 0	NA	NA	NA	NA	1,000,000	138,122	1,200,000	1,111,745	700,000	175,420	1,500,000	1,426,287
PL9 BSC	Number of farmers using market information generated through project assistance	NA = 0	NA	NA	NA	NA	1,000	3,765	1,500	8,000	500	1,500	5,000	13,265
4.5.1.17 FTF/4.4.3.13	Kilometers of roads improved or constructed	NA = 0	NA	5		17.7	25	0	100	0	19	0	100	22.7
4.4.3.7 F	Number of beneficiaries receiving improved transport services due to USG	NA = 0	NA	NA		T: 41,000 M: 24,600 F: 16,400	T: 15,000 M: 9,000 F: 6,000	T: 0 M: 0 F: 0	T: 68,081 M: 33,894 F: 34,187	T: 0 M: 0 F: 0	T: 67,800 M: 40,800 F: 27,000	T: 0 M: 0 F: 0	T: 67,800 M: 40,800 F: 27,000	T: 41,000 M: 24,600 F: 16,400
C.5.2.1.5	Number of kilometers of irrigation systems repaired	NA = 0	20	49.6	40	85	100	23.2	100	113	20	22	280	292.2
4.5.1.24 FTF	Numbers of Policies/Regulations/Administrative Procedures in each of the following stages of development as a result of USG assistance in each case: Stage 1: Analyzed Stage 2: Drafted and presented for public/stakeholder consultation Stage 3: Presented for legislation/decree Stage 4: Passed/approved Stage 5: Passed for which implementation has begun	NA = 0	NA	1	3	2	2	2	4	T: 4 New: 2 Cont: 2	5 New: 1 Cont: 4	T: 5 New: 1 Cont: 4	10	11
4.5.1 .27	Average percent change in score on key areas of organization capacity amongst USAID direct and indirect local implementing partners	34% (2012)	NA	NA	NA	NA	20%	34%	40%	55%	NA	55%	50%	55%
4.5.2.49 FTF	Number of firms (excluding farms) or Civil Society Organizations engaged in Agricultural and Food security-related manufacturing and services now operating more profitably (at or above cost) because of USG assistance	NA = 0	NA	NA	NA	T: 2 Firm: 2	T: 10 Firm: 10	T: 7 Firm: 7	T: 10 Firm: 10	T:16 Firm: 2 CSO: 14	T: 10 Firm: 0 CSO: 10	T: 12 Firm: 0 CSO: 12	T: 30 Firm: 15 CSO: 15	T: 47 Firm: 21 CSO: 26
4.5.2.11 FTF	Number of food security private enterprises, producers	NA = 0	NA	276		84	54	273	T: 14 New: 2	T:289 New:14	T:287 New: 0	T:294 New: 5	T: 300	T: 294 Firn:294

Indicator #	Indicator	Baseline	FY 10 target	FY 10 actual	FY 11 target	FY 11 actual	FY 12 target	FY 12 actual	FY 13 target	FY 13 actual	FY 14 target	FY 14 actual	LOP target	LOP actual
	organizations, water users associations, women's groups, trade and business associations, and community-based organizations (CBOs) receiving USG assistance.								Cont: 273	Cont:275 Firn:289 Private:4 Producer org: 261 Water users: 2 Women groups: 17 Trade: 5	Cont:287 Firn:287 Private:0 Producer org: 272 Water users: 2 Women groups: 9 Trade: 4	Cont:287 Firn:287 Private:0 Producer org: 272 Water users: 2 Women groups: 9 Trade: 4		Private:0 Producer org: 272 Water users: 2 Women groups: 9 Trade: 9
4.5.2.28 FTF	Number of private enterprises, producers organizations, water users associations, women's groups, trade and business associations, and community-based organizations (CBOs) that applied new technologies or management practices as a result of USG assistance	NA = 0	NA	NA		184	20	39	6	T: 8 Producer: 6 Women groups: 2	0	5	26	236 Producer: 236 Women groups: 9
4.5.2-12 F	Number of public-private partnerships formed as a result of FTF assistance	NA = 0	5	3	7	5	4	4	3	T: 3 Ag prod: 1 Ag transform : 2	0	2 Ag trans: 2	19	17
4.5.2-13 F	Number of rural households benefiting directly from USG interventions	NA = 0	6,000	65,605	64,000	91,424	30,000	27,4165	T: 55,000 New: 15,000 Cont: 40,000	T: 69,511 New: 15,322 Cont: 54,189	T: 60,000 New: 5,000 Cont: 55,000	T:64,888 N:110 Cont: 64,778	T:60,000	T:64,888 M: 33,417 F: 31,471
PL14	Number of rural households who have increased farm income thanks to USG government	NA = 0	5,000	NA	10,000	20,826	10,000	14,451	T: 30,000 New: 15,000 Cont: 15,000	T: 30,422	T: 45,000 New: 15,000 Cont: 30,000	T:36,582 New: 6,160 Cont: 30,422		
4.5.2 FTF	# of jobs attributed to FTF implementation	NA = 0	NA	6,593	NA	New:1,163 Cont: 1,434 Temp: 718 Perm: 2,152	1,500	New: 1,440 Cont: 2,152 Temp: 123 Perm: 1,317	1,000	T: 601 M: 403 F: 198 Temp: 592 Perm: 1,651	300	234	10,000	10,031