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**UPPER WATERSHED LANDS UNDER IMPROVED NATURAL
RESOURCE MANAGEMENT**



MAY 2014

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The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

CONTEXT

The Feed the Future West/WINNER project contributes to pillar B of the USAID Haiti Mission's strategic objective: Food and Economic Security. The project seeks to improve livelihoods and food security in its areas of intervention in Haiti through three intermediate results:

1. Agricultural productivity increased
2. Watershed Stability Improved
3. Agricultural markets strengthened

In the course of the project, the FtF West/WINNER team has undertaken a number of activities in upper watersheds to improve natural resource management including, agro-forestry activities, soil conservation, and the improved governance of protected areas.

This report presents the number of hectares under improved natural resources management as a result of FtF West/WINNER activities.

DEFINITION OF IMPROVED NATURAL RESOURCES MANAGEMENT

While there is not a single definition of improved natural resources management, there is guidance from a recent Feed the Future document.¹ In this guidance document, the following excerpts are relevant for this report.

Previously, the definitions did not include detailed explanation and examples of technologies supporting natural resources management and climate change adaptation. As a result, NRM and CC adaptation technologies and practices were not “counted” nor monitored as important outputs and outcomes contributing to, in most cases, improved agricultural productivity.

As such, the most notable changes in the definitions are adjustments to include a broader list of technologies that may address climate change adaptation and mitigation in four categories:

- *Mechanical and physical*
- *Biological*
- *Chemical*
- *Management and cultural practices*

Risk reducing management practices in agriculture and livestock might include:

- *Changing the exposure or sensitivity of crops (e.g., switching crops, using a greenhouse, or changing the cropping calendar);*
- *Soil management practices that reduce rainwater run-off and increase infiltration;*
- *Changing to improve grazing practices;*

¹ Feed the Future, M&E Guidance Series, “Volume 7: Measuring Natural Resources Management and Climate Change Resiliency under Feed the Future”, January 2014.

- *Adjusting the management of other aspects of the system;*
- *Applying new technologies like improved seeds or irrigation methods; and*
- *Diversifying into different income-generating activities or into crops that are less susceptible to drought and greater climatic variability.*

ACTIVITIES THAT IMPROVED NATURAL RESOURCES MANAGEMENT

Based on the examples provided above, the following activities contributed to improved natural resource management under FtF West/WINNER:

- Agro-forestry
- Ravine treatment and soil conservation
- Implementation of greenhouses on hillsides
- Construction of water catchment basins on hillsides
- Support for protected areas management

In order to estimate the upper watershed areas under improved natural resources management, we analyzed the information available for each set of activities. The results are presented below.

Agro-forestry

In a separate report, we present the upper watershed lands planted with fruit and forest trees.² Table 1 below presents the surface area planted with trees as a result of FtF West/WINNER activities. Overall, the total surface area planted with trees is 34,656.

Table 1. 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 has been implementing ravine treatment and soil conservation activities since 2010. We estimated the total area 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 2 below summarizes the ravine treatment and soil conservation activities undertaken by FtF West/WINNER.

² Feed the Future West/WINNER, "Report on Upper Watershed Lands Planted with Fruit and Forest Trees", May 2014

Table 2. Area Stabilized by Ravine Treatment and Soil Conservation Activities

Year	# of projects	Quantity of sediments trapped (m³)	# of trees planted	# of vetiver plants installed	Gabions and drywalls installed (m³)	Length of treated ravines	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

Implementation of greenhouses on hillsides

In the course of the project, 373 greenhouses were installed on hillsides of Petionville, Kenscoff, and in the Matheux corridor. On average, the 70m³ greenhouses provided by the project generate as much income as hillside farmers make on one hectare of land using traditional and unsustainable practices. There is clear evidence that farmers using greenhouses are abandoning some of the cultivation of steep hillsides. As per their agreement with the project, they have to plant trees in the areas where they used to farm. We estimate that, for each greenhouse provided by the project, 0.5 hectares of hillside lands are no longer cultivated using unsustainable practices. Therefore, the area under improved natural resources management due to the implementation of the greenhouses by FtF West/WINNER is 186.5 hectares.

Construction of water catchment basins on hillsides

FtF West/WINNER has implemented 9 water catchment basins in the hillside areas of the Cul-de-Sac, the Matheux corridor, and Gonaïves. These water catchments capture and store rainwater for irrigation purposes. Farmers can use the water in the basins to irrigate fields in the dry season. This is particularly useful when linked to the greenhouses described above, using drip irrigation systems. While the more rational use of water resources on hillsides using water catchment basins undoubtedly constitutes improved natural resources management, we are not able to estimate the areas impacted by the use of these basins.

Support for protected areas management

FtF West/WINNER supported the Haitian Ministry of Environment in several ways to improve the management of protected areas:

- The project prepared a report in December 2009 entitled: “La Visite National Park and WINNER Management Strategies” that outlined strategies to improve the Park’s management;

- The project helped prepare the decree for the creation of the Designated National Authority to allow Haiti to be eligible for funding through carbon credits under provisions of the Kyoto Protocol on Global Climate Change;
- The project providing equipment to the National Agency for Protected Areas (Agence Nationale des Aires Protégées), created in 2011;
- The project provided equipment for the National Surveillance Corps (Corps National de Surveillance) tasked with monitoring protected areas. The equipment provided included all-wheel drive vehicles; GPS equipment, communications equipment, protective gear, computers, and IT equipment for the warden affected to the protected areas. This equipment was transferred to the Ministry of Environment in 2013 for the monitoring of the Parc la Visite.

Although the Parc la Visite total area is 46,000 hectares, the most ecologically sensitive areas include: the cloud forest buffer zones outside the park (610 hectares) and the escarpment inside the park (1,030 hectares).

The deployment of agents from the Corps de Surveillance with the equipment provided by FtF West/WINNER for the effective monitoring of the sensitive protected areas (especially to prevent the illegal cutting of trees) should result in improved management of the park overtime. However, as of May 2014, we cannot claim that this improved management has started in earnest.

SURVEY ON THE MANAGEMENT OF NATURAL RESOURCES IN FTF WEST/WINNER AREAS OF INTERVENTIONS

In February and March of 2014, we conducted a survey of the management of natural resources in the hillside areas of the Cul-de-Sac and Matheux corridors.

In the Cul-de-Sac hillsides, the project team surveyed 1,850 farmers on how improved natural resources management practices recommended by FtF West/WINNER were followed and what their impacts were. The results showed that, while some unsustainable practices continue (e.g., wood cutting), fewer farmers are cultivating on steep slopes, they use better seeds, they increasingly use compost to increase soil fertility, and they apply most of the technical itineraries prescribed by the project.

In the Matheux corridor, 1,000 farmers involved in agricultural production, agro-forestry, greenhouses, and ravine treatment and soil conservation, were surveyed on the changes in practices related to natural resources management resulting from their interaction with FtF West/WINNER. While practices that degrade the environment are still practiced (e.g., wood cutting, cultivation on steep slopes), most farmers report that they have a better understanding of sustainable practices such as soil conservation, terracing, tree planting, and using crops that do

not lead to soil loss. More than 90% of farmers surveyed reported having acquired soil conservation skills that they are applying.

SUMMARY OF UPPER WATERSHED AREAS UNDER IMPROVED NATURAL RESOURCES MANAGEMENT

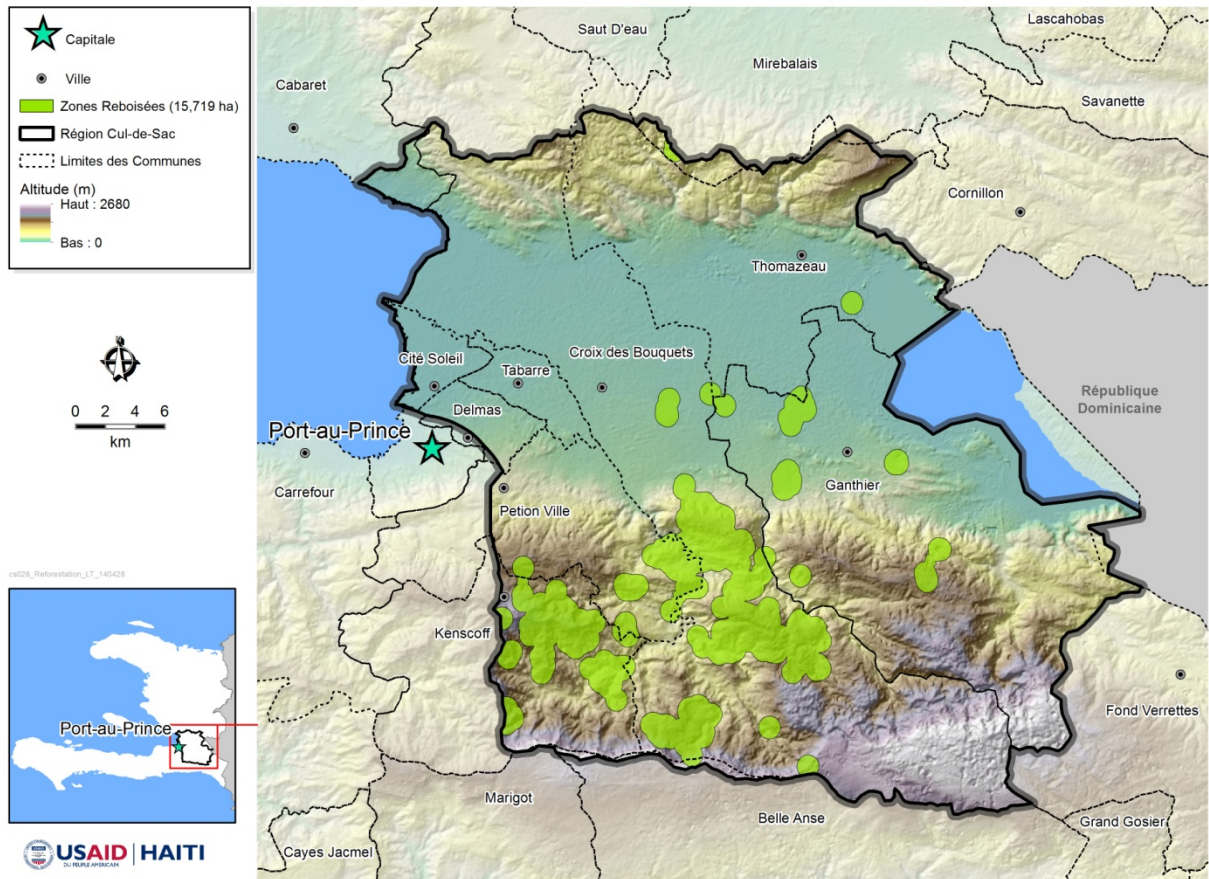
Overall, we can estimate that 37,065 hectares of upper watershed lands are under improved natural resources management as a result of the interventions of FtF West/WINNER. Table 3 below presents the areas under improved natural resources management due to the project's various activities.

Table 3. Summary of areas under improved natural resources management as a result of FtF West/WINNER activities

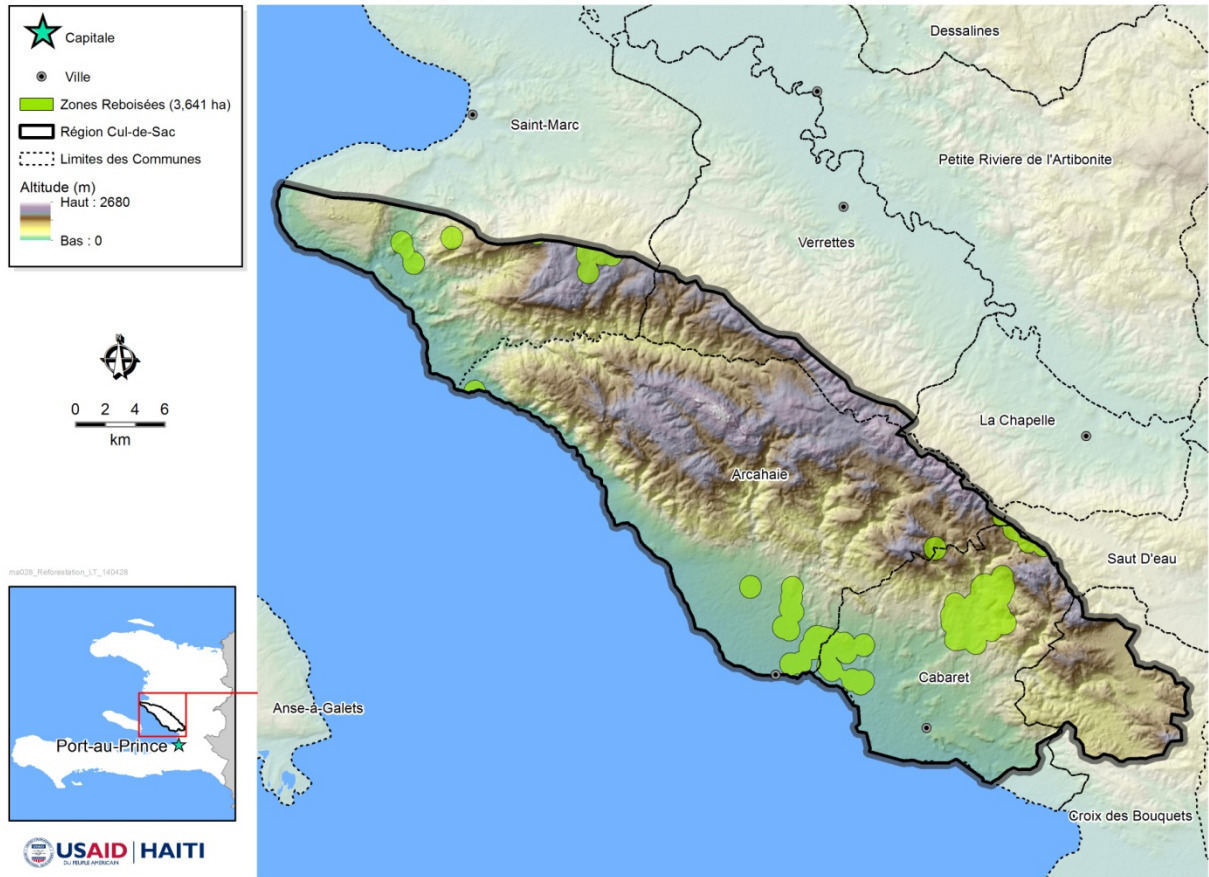
Activity	Impact on improved natural resources management	Upper watershed areas under improved NRM (hectares)
Agro-forestry	The planting of fruit and forest trees in hillside areas will help reduce runoff, retain soil, and improve biodiversity.	34,656
Ravine treatment and soil conservation	The stabilization of ravines and soil conservation activities in areas surrounding ravines improve soil retention, reduce runoff, limit the negative impacts of erosion, and leads to more stable hillsides.	582
Implementation of greenhouses	The farmers using the greenhouses are abandoning unsustainable farming practices on steep slopes and are planting trees in previously cultivated areas.	187
Management of protected areas	The deployment of well-equipped wardens at the Parc la Visite will reduce tree cutting and improve the management of a key protected area in Haiti.	1,640
Total		37,065

Figures 1, 2 and 3 below provide maps of the hillside areas under improved natural resources management due to agro-forestry activities in the Cul de Sac, Matheux, and Mirebalais/Saut d'Eau regions.

FTF West / WINNER - Zones Reboisées dans la Région du Cul-de-Sac



FTF West / WINNER - Zones Reboisées dans le Corridor des Matheux



FTF West / WINNER - Zones Reboisées dans la Région de Mirebalais-Saut-d'Eau

