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Report No: ICR00002741

IMPLEMENTATION COMPLETION AND RESULTS REPORT
(IDA – H4080)

ON A

CREDIT

IN THE AMOUNT OF SDR 21.3 MILLION
(US$ 35 MILLION EQUIVALENT)

TO THE

REPUBLIC OF RWANDA

FOR A

RWANDA SECOND RURAL SECTOR SUPPORT PROJECT
IN SUPPORT OF THE
RURAL SECTOR SUPPORT PROGRAM (APL)

April 30, 2013

Sustainable Development Department
Agriculture, Rural Development and Irrigation (AFTA2)
Africa Region

CURRENCY EQUIVALENTS
(Exchange Rate Effective April 18, 2013)

Currency Unit = Rwandan franc (RWF)
635 RWF = US$ 1
0.6629 SDR = US$ 1

FISCAL YEAR
July 1 – June 30

ABBREVIATIONS AND ACRONYMS

AfDB	African Development Bank
APL	Adaptable Program Loan
ASWG	Agricultural Sector Working Group
BNR	Banque Nationale du Rwanda (National Bank of Rwanda)
CAADP	Comprehensive African Agriculture Development Program
CAS	Country Assistance Strategy
CETSE	Commercial Enterprise and Technical Support Entity
CEPEX	Central Projects and External Finance Bureau
EDPRS	Economic Development and Poverty Reduction Strategy
EICV	Enquête Intégrale sur les Conditions de Vie des Ménages au Rwanda (Household Living Standards Survey)
ERR	Economic Rate of Return
ESMF	Environmental and Social Management Framework
FAO	Food and Agriculture Organization of the United Nations
FM	Financial management
FY	Fiscal Year
GDP	Gross Domestic Project
GHG	Greenhouse gas
ha	Hectare
HH	Households
ICR	Implementation Completion Results Report
IDA	International Development Association
IEG	Independent Evaluation Group
IFAD	International Fund for Agricultural Development
IPM	Integrated Pest Management
ISR	Implementation Status Report
kg	Kilograms
LDF	Local Development Fund
m	Million
M&E	Monitoring and evaluation
MINAGRI	Ministry of Agriculture and Animal Resources
MINECOFIN	Ministry of Finance and Economic Planning
MIS	Management Information System
MTR	Mid-term Review
NGO	Non-Governmental Organization
NISR	National Institute of Statistics of Rwanda
NPK	Nitrogen, phosphorus, potassium (fertilizer)
NPV	Net Present Value
O&M	Operation and Maintenance

OPI	Overall Program Indicators
OPM	Oxford Policy Management Limited
PAC	Program Advisory Committee
PAD	Project Appraisal Document
PDO	Project Development Objective
PHRD	Policy and Human Resources Development
PMP	Pest Management Plan
PSCU	Project Support and Coordination Unit
PSTA	Plan Stratégique pour la Transformation Agricole (Strategic Plan for Agricultural Transformation)
QAG	Quality Assurance Group
RAB	Rwanda Agricultural Board
RAP	Resettlement Action Plan
RCA	Rwanda Cooperative Agency
REMA	Rwanda Environmental Management Authority
RIF	Rural Investment Facility
RPF	Resettlement Policy Framework
RSSP	Rural Sector Support Program
RSSP 1	First Rural Sector Support Project
RSSP 2	Second Rural Sector Support Project
RSSP 3	Third Rural Sector Support Project
RWF	Rwandan franc
SLM	Sustainable Land Management
SPIU	Single Project Implementation Unit
SWAp	Sector Wide Approach
t	Metric ton
WUA	Water User Association

Vice President:	Makhtar Diop
Country Director:	Johannes C.M. Zutt
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RWANDA
SECOND RURAL SECTOR SUPPORT PROJECT (RSSP 2)

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DATA SHEET SECTION

RWANDA
SECOND RURAL SECTOR SUPPORT PROJECT (RSSP 2)

A. Basic Information			
Country:	Rwanda	Project Name:	Second Rural Sector Support
Project ID:	P105176	L/C/TF Number(s):	IDA-H4080
ICR Date:	04/01/2013	ICR Type:	Intensive Learning ICR
Lending Instrument:	APL	Borrower:	GOVERNMENT OF RWANDA
Original Total Commitment:	XDR 21.30 m	Disbursed Amount:	XDR 21.30 m
Revised Amount:	XDR 21.30 m		
Environmental Category: B			
Implementing Agencies: PSCU-RSSP (MINAGRI) Ministry of Agriculture (MINAGRI)			
Cofinanciers and Other External Partners:			

B. Key Dates				
Process	**Date**	**Process**	**Original Date**	**Revised / Actual Date(s)**
Concept Review:	07/24/2007	Effectiveness:	10/22/2008	10/22/2008
Appraisal:	02/05/2008	Restructuring(s):		
Approval:	06/24/2008	Mid-term Review:	10/31/2010	10/04/2010
		Closing:	10/31/2012	10/31/2012

C. Ratings Summary	
C.1 Performance Rating by ICR	
Outcomes:	Highly Satisfactory
Risk to Development Outcome:	Moderate
Bank Performance:	Satisfactory
Borrower Performance:	Highly Satisfactory

C.2 Detailed Ratings of Bank and Borrower Performance (by ICR)			
Bank	**Ratings**	**Borrower**	**Ratings**
Quality at Entry:	Satisfactory	Government:	Highly Satisfactory
Quality of Supervision:	Highly Satisfactory	Implementing Agency/Agencies:	Highly Satisfactory
Overall Bank Performance:	Satisfactory	**Overall Borrower Performance:**	Highly Satisfactory

C.3 Quality at Entry and Implementation Performance Indicators			
Implementation Performance	**Indicators**	**QAG Assessments (if any)**	**Rating**
Potential Problem Project at any time (Yes/No):	No	Quality at Entry (QEA):	None
Problem Project at any time (Yes/No):	No	Quality of Supervision (QSA):	None
DO rating before Closing/Inactive status:	Satisfactory		

D. Sector and Theme Codes

	Original	Actual
Sector Code (as % of total Bank financing)		
Agro-industry, marketing, and trade	20	20
General agriculture, fishing, and forestry sector	50	50
Irrigation and drainage	30	30

Theme Code (as % of total Bank financing)		
Other rural development	33	33
Rural policies and institutions	17	17
Rural services and infrastructure	33	33
Water resource management	17	17

E. Bank Staff

Positions	At ICR	At Approval
Vice President:	Makhtar Diop	Obiageli Katryn Ezekwesili
Country Director:	Johannes C.M. Zutt	Colin Bruce
Sector Manager:	Severin L. Kodderitzsch	Karen McConnell Brooks
Project Team Leader:	Mark A. Austin	Michael Morris
ICR Team Leader:	Mark A. Austin	
ICR Primary Author:	Richard Anson	

F. Results Framework Analysis

(a) PDO Level/Outcome Indicators:

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1:	**By the end of the project, production of rice in marshlands rehabilitated or developed under RSSP2 has increased by at least 100% relative to the baseline**			
Value quantitative or qualitative)	5,597 t	11,194 t		18,675 t
Date achieved				31 October 2012
Comments (incl. % achievement)	The target was achieved at 167%. Baseline was finalized once all marshlands to be developed under the project were approved, which was by MTR.			

Indicator 2:	**By the end of the project, at least 50 percent of farmers in marshland and hillside areas developed or rehabilitated by RSSP 1 and RSSP 2 have adopted sustainable marshland or hillside intensification technologies.**		
Value quantitative or qualitative)	25% of HH have adopted at least two of the identified practices	50% of HH	98% of HH
Date achieved			31 October 2012
Comments (incl. % achievement)	The target was achieved at 196%. The PAD defined adoption of sustainable intensification technologies as adoption of at least two of the following: soil fertility management, IPM, conservation tillage, contour bunding, construction of erosion control structures including terraces, vegetative strips, and agroforestry practices. Households' adoption of sustainable intensification technologies was measured directly from the Impact Assessment survey and found to be at 98% (adoption of two of any of the technologies). The uptake rates for specific technologies were: 79% using IPM, 88% using vegetative strips, and 78% using agroforestry, while radical terracing was used by 14% and 22% and conservation tillage by 30% and 36% of marshland and hillside HH, respectively.		

Indicator 3:	**By the end of the project, at least 20 cooperatives with business plans and supported by RSSP 2 have increased their revenues from sales by 50% relative to the baseline**			
Value (qualitative or quantitative)	0 cooperative	20 cooperatives		67 cooperatives
				31 October 2012
	The target achieved at 335%. The PAD indicated that baseline revenues would be determined once the cooperatives to be supported were chosen. The Impact Assessment survey documented that 67 cooperatives had achieved revenue increases exceeding 50% compared to their respective baseline; these included 18 cooperatives that increased revenues by more than 1,000%.			

(b) Intermediate Outcome Indicators

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years

Indicator 1:	**By the end of the project, at least 3,300 additional ha of irrigated marshland have been rehabilitated or developed by the project (EDPRS/PSTA indicator).**			
Value (quantitative or qualitative)	3,110 ha	6,410 ha		6,434 ha
Date achieved				31 October 2012
Comments (incl. % achievement)	The target was achieved at 100%. RSSP 2 brought 3,324 ha of new marshland into operation. Nine sites were developed under RSSP 2, including seven sites rehabilitated or extended and two sites newly developed. Eight dams were built in five sites, while on other sites, only rehabilitation works took place.			

Indicator 2:	**By the end of the project, at least 75% of the farmers in irrigated marshlands rehabilitated or developed by the project (RSSP 1 and RSSP 2) are paying water charges through water user associations (WUAs).**			
Value (quantitative or qualitative)	NA	75%		95%
Date achieved				31 October 2012
Comments (incl. % achievement)	The target was achieved 126%. A Ministerial Order N°001/11.30 establishing WUAs in irrigation schemes was approved by the Cabinet in September 2011 and published in the *Official Gazette nº 50 of 12/12/2011*. WUA committees were elected and trained in 23 marshlands, and 95% payment of water fees.			

Indicator 3:	**By the end of the project, at least 9,900 additional ha of hillsides have been sustainably developed by the project (EDPRS/PSTA indicator).**			
Value (quantitative or qualitative)	14,485 ha	24,385 ha		24,581 ha
Date achieved				31 October 2012
Comments (incl. % achievement)	The target was achieved at 102%. During RSSP 2, 10,096 additional ha (for a total of 24,581 ha) were protected against soil erosion using erosion control structures such as terraces, conservation tillage, and contour bunding or by planting permanent crops or permanent vegetation. The baseline includes all hillside ha developed by RSSP 1 (August 2008).			

Indicator 4:	**By the end of the project, at least 80 cooperatives supported by the project have quality business plans under implementation.**			
Value (quantitative or qualitative)	0 cooperatives	80	80	81
Date achieved				31 October 2012
Comments (incl. % achievement)	The target was achieved at 101%. Of the 83 cooperatives supported by RSSP 2, 81 have been assisted by their local service providers to develop business plans. RSSP validated the quality of those plans, which are now under implementation (executing activities described in the business plan).			

Indicator 5:	**By the end of the project, at least 5 additional cooperatives supported by RSSP 2 are marketing certified maize or potato seed.**

Value (quantitative or qualitative)	4	9	9	19 cooperatives
Date achieved				31 October 2012
Comments (incl. % achievement)	The target was achieved at 211%. An additional 15 cooperatives supported by RSSP 2 produce certified maize and potato seed. Certification of seed producers is under RAB.			

Indicator 6:	**By the end of the project, with at least 75% of the rural infrastructure subprojects funded through the Local Development Fund (LDF), the majority of users are satisfied one year after the subproject was completed.**			
Value (quantitative or qualitative)	NA	75%	75%	98%
Date achieved				31 October 2012
Comments (incl. % achievement)	The target was achieved at 130%. The Impact Assessment revealed that over 65% of users are very satisfied with the facilities provided under the LDF and over 98% are either very or fully satisfied with the infrastructure.			

(c) Overall Program Indicators

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1:	**Change in the average level of household incomes among Programme direct beneficiary households.**			
Value (quantitative or qualitative)	RWF 48,840	NA	NA	RWF 232,000
Date achieved				31 October 2012
Comments (incl. % achievement)	The baseline for Program Indicator 1 comes from the Impact Assessment survey at the end of RSSP 1 and measures income from sales in beneficiary households. The Impact Assessment for RSSP 2 used the figure of RWF 232,000, which is the mean annual consumption expenditure per adult equivalent for RSSP 1 beneficiaries taken from the 2010/2011 Integrated Household Living Conditions Survey (EICV3). No Target was set (NA). These two baselines are not comparable given one measures income and the other consumption. From these numbers it is difficult to say anything more than that the figure has clearly increased. However, it is possible to compare the figure for RSSP beneficiaries in sample with a comparator figure from the same EICV3 dataset. The comparator figure is for all rural households outside Kigali (not benefiting from RSSP) where at least one household member has a main job on the family farm and is RWF 214,964. So it can be said that RSSP beneficiaries have experienced improvements in their absolute consumption figures and have higher consumption levels than their peers in Rwanda. Given the lack of comparability between income and consumption, it was			

	agreed that the evaluation RSSP 3 for the Program level indicator 1 would measure both income and consumption.

Indicator 2:	**Change in the percentage of Programme direct beneficiary households under the poverty line.**			
Value (quantitative or qualitative)	65.7%	NA	NA	39.3%
Date achieved				31 October 2012
Comments (incl. % achievement)	The baseline for Indicator 2 is also taken from the Impact Assessment survey for RSSP 1. The equivalent figure for 2010/11 from the EICV3 data is 39.3% for RSSP 1 and 2 beneficiaries, a significant reduction in the proportion of beneficiary households below the poverty line. The rural poor in Rwanda remain at 48.7% (EICV3). No Target was set (NA).			

Indicator 3:	**Change in the average level of rice yields per hectare in districts having marshlands rehabilitated or developed by the Programme.**			
Value (qualitative or quantitative)	2.7 t/ha	NA	NA	5.68t/ha in 2012 average for Districts and 6.7t/ha for RSSP 2 beneficiaries
Date achieved				31 October 2012
Comments (incl. % achievement)	Indicator 3 is measured from MINAGRI crop assessment surveys. The districts in which RSSP had rehabilitated or developed marshlands were identified, and the average crop yield calculated by simply dividing total production in those districts by area under rice production. RSSP direct beneficiary production data are available at RSSP M&E department. No target was set (NA).			

(d) APL Phase 3 triggers

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1:	**By the end of the project, at least 3,300 additional ha of irrigated marshlands have been rehabilitated or developed by the project (EDPRS/PSTA indicator).**			
Value (quantitative or qualitative)	3,110 ha baseline for RSSP 2	6,410	6,410	6,434 ha
Date achieved				31-Oct-2012
Comments (incl. % achievement)	The target was achieved at 100%. RSSP 2 brought 3,324 ha of new marshland into operation. Nine sites were developed under RSSP 2, including seven sites rehabilitated or extended and two sites newly developed. Eight dams were built in five sites, while on other sites only rehabilitation works took place.			

Indicator 2:	**By the end of the project, at least 9,900 additional ha of hillsides have been sustainably developed by the project (EDPRS/PSTA indicator).**			
Value (quantitative or qualitative)	14,485 ha	24,385 ha		24,581 ha

Date achieved				31 October 2012
Comments (incl. % achievement)	The target was achieved at 102%. During RSSP 2, 10,096 additional ha (for a total of 24,581 ha) were protected against soil erosion using erosion control structures such as terraces, conservation tillage, and contour bunding or by planting permanent crops or permanent vegetation. The baseline includes all hillside ha developed by RSSP 1 (August 2008).			

Indicator 3:	**By the end of Phase 2, average crop yields on farmed marshlands and hillsides developed under the project are 100% higher relative to the beginning-of-Phase-1 baseline.**			
Value (quantitative or qualitative)	Rice: 3 t/ha Maize: 0.8 t/ha Potato: 8.6 t/ha	Rice: 6 t/ha Maize: 1.6 t/ha Potato: 17.2 t/ha	Rice: 6 t/ha Maize: 1.6 t/ha Potato: 17.2 t/ha	Rice: 6.7 t/ha Maize: 4.05 t/ha Potato: 19.7 t/ha
Date achieved				31-Oct-2012
Comments (incl. % achievement)	The target achieved at 111% for rice, 253% for maize and 115% for Potato.			

Indicator 4:	**By the end of Phase 2, crop-derived incomes of farmers assisted by CETSES are 50 percent higher relative to the end-of-Phase-1 baseline.**			
Value (quantitative or qualitative)	RWF 46,207 (from 2008 IA survey)	RWF 69,311	RWF 69,311	RWF 157,121
Date achieved				31-Oct-2012
Comments (incl. % achievement)	Target achieved at 226%. The mean income derived from crop sales over the past 12 months at the end of RSSP 2 was RWF 157,121. The Impact Assessment study calculated this figure from the sales of banana, rice, wheat, cassava, and maize (the same crops used for the baseline).			

Indicator 5:	**By the end of the project, at least 75% of the farmers in irrigated marshlands rehabilitated or developed by the project (RSSP 1 and RSSP 2) are paying water charges through water user associations.**			
Value (quantitative or qualitative)	N/A	75%	75%	95%
Date achieved				31-Oct-2012
Comments (incl. % achievement)	The target was achieved at 126%. A Ministerial Order N°001/11.30 establishing WUAs in irrigation schemes was approved by the Cabinet in September 2011 and published in the *Official Gazette nº 50 of 12/12/2011*. WUA committees were elected and trained in 23 marshlands and 95% payment of water fees			

Indicator 6:	**By the end of the project, at least 20 cooperatives with business plans and supported by RSSP 2 have increased their revenues from sales by 50% relative to the baseline**			
Value (quantitative or qualitative)	0 cooperative	20 cooperatives	20 cooperatives	67 cooperatives
Date achieved				31-Oct-2012

Comments (incl. % achievement)	The target was achieved at 335%. The PAD indicated that baseline revenues would be determined once the cooperatives to be supported were chosen. The Impact Assessment survey documented that 67 cooperatives increased their revenues by more than 50% compared to their respective baselines; these included 18 cooperatives where revenues rose by more than 1,000%.

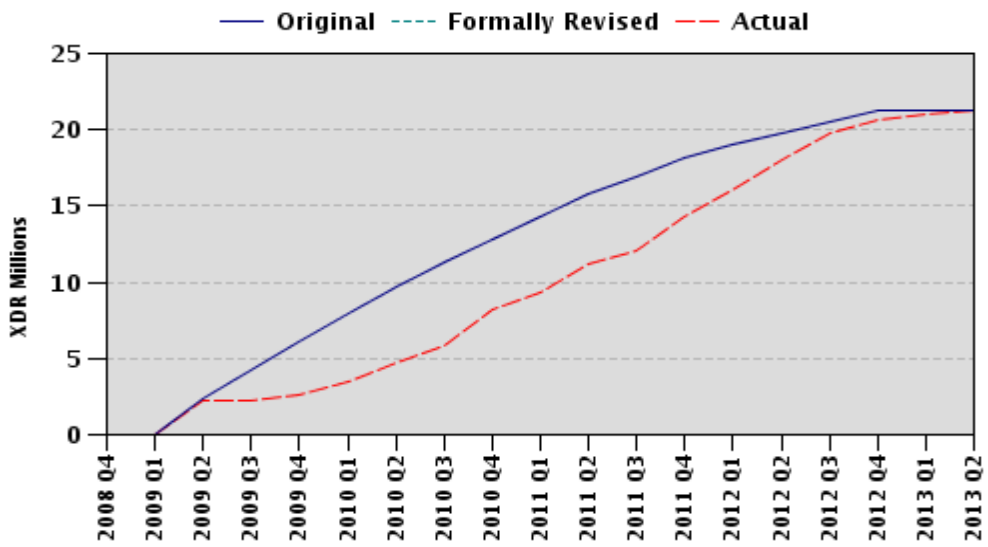
G. Ratings of Project Performance in ISRs

No.	Date ISR Archived	DO	IP	Actual Disbursements (US$ millions)
1	12/22/2008	Satisfactory	Satisfactory	3.27
2	5/11/2009	Satisfactory	Satisfactory	3.92
3	08/10/2009	Satisfactory	Satisfactory	4.68
4	03/30/2010	Satisfactory	Satisfactory	8.91
5	11/28/2010	Satisfactory	Satisfactory	16.25
6	07/9/2011	Satisfactory	Satisfactory	22.06
7	10/20/2011	Satisfactory	Satisfactory	22.84
8	06/11/2012	Satisfactory	Satisfactory	31.78

H. Restructuring (if any)

Not Applicable.

I. Disbursement Profile



1. Country Context, Development Objectives, and Design

1.1 Country Context

1. The 1994 genocide and the preceding civil conflicts left Rwanda among the poorest countries in the world, with a per capita income of US$ 245 in 2008—far lower than its 1990 per capita income of US$ 370. The poverty headcount (households living below the poverty line of US$ 1 per day) had increased from 40 percent in 1985 to 51.2 percent in 1993 and to 57 percent in 2008. Rwanda's population of 9.5 million in 2008 was growing at 2.8 percent per year. At 387 persons per square kilometer, Rwanda placed among the 10 most densely populated countries in the world and the highest in sub-Saharan Africa. In early 2008, 90 percent of Rwandans lived in rural areas, where about 80 percent engaged in subsistence agriculture. The rural poverty headcount stood at 67 percent in 2008.[1]

2. Rapid population growth and the scarcity of new arable land seriously threatened the rural sector's revival. Rwanda faced increasing labor intensity and declining labor productivity in agriculture, declining average farm size (0.2 ha of arable agricultural land net of permanent pasture per rural resident), worsening land degradation, pressure on off-farm employment and wages, and fragile food security. Growth in agricultural production had fallen from 0.8 percent over 1975-84, to -2.2 percent over 1985-1989, and further to -6.7 percent between 1990 and 1996.[2] Poor performance of agriculture was costly for the overall economy—the sector contributed 39 percent of GDP in 2008, down from 44 percent of GDP in 1990, and accounted for 80 percent of employment and 63 percent of foreign earnings.[3]

3. Research confirmed that better growth in agriculture would be achieved through better integration of Rwanda's smallholder farmers into market transactions. The 2007 Agriculture Policy Note (APN)[4] found that regional and international markets might offer attractive opportunities over the longer run but that domestic markets would generate strong demand in the short to medium term. Since Rwanda already faced a structural food deficit, the Government of Rwanda's (GoR's) strong focus on sustainable development of marshlands for food crop production was clearly justified. The analysis showed three possible sources of future growth on the supply side: (i) increased scale of production; (ii) increased productivity; and (iii) value addition.

4. Government confirmed its intent to intensify and commercialize agriculture and diversify economic activities in the rural areas, and to shift from the past approach of food security toward a greater market orientation. Government realized that raising agricultural productivity, increasing production, and meeting the demand of the domestic food markets was critical to increasing food security and reducing poverty. Government also sought to transition farmers from subsistence to commercial farming, as consistently reflected in a series of national and sector strategies. Accordingly, the Bank assisted GoR to design a three-phase Adaptable Program Loan (APL) to help implement this strategy. An urgent priority for Government to address its

[1] RSSP2 Project Appraisal Document(PAD), 2008, p.1., www.indexmundi.com and Country Assistance Strategy (CAS) FY09-FY12, 2009, p.5.
[2] RSSP1 Implementation Completion and Results Report (ICR), 2008, p.1.
[3] The following sources (respectively): GDP: National Institute of Statistics of Rwanda (NISR), 2005; employment: Enquete Intégrale sur les Conditions de Vie des Ménages au Rwanda (EICV), 2005-06; FE earnings: Banque Nationale du Rwanda (BNR)/Ministry of Finance and Economic Planning (MINECOFIN), 2006..
[4] Agriculture Policy Note: Promoting Pro-Poor Agricultural Growth in Rwanda: Challenges and Opportunities, World Bank, 2007

structural food deficit and increased share of marketed production was the development for irrigation of 60,000 ha of marshlands, along with the sustainable development of surrounding hillsides, which are two main pillars supported by the RSSP APL series. [5]

5. The Second Rural Sector Support Project (RSSP 2) comprised the second phase of a 17-year Adaptable Program Loan (APL) being implemented in three phases by the Ministry of Agriculture and Animal Resources (MINAGRI). RSSP aims to help GoR achieve its strategic goal of unlocking rural growth in order to increase incomes and reduce poverty. The RSSP APL series seeks to achieve this objective by providing the technology, infrastructure, support services, and institutional capacity needed for faster growth in the rural economy.

- **Phase 1: 2001-08**: The emphasis during the first phase was on building the institutional, technical, and human capacity to support the adoption of sustainable intensification technologies in developed marshlands and surrounding hillsides. This phase faced enormous challenges in implementation due to an overly complex design and weak institutional capacity but rebounded from near cancelation after a restructuring following the Mid-term Review (MTR) and securing a two-year extension. It achieved its development objectives and the overall outcome of this phase was rated Satisfactory.
- **Phase 2: 2008-13**: During the second phase, the emphasis was on broadening and deepening the support provided to accelerate the intensification and commercialization of agricultural production. The overall outcome of this phase is rated Highly Satisfactory as reflected in the present Implementation Completion and Results Report (ICR).
- **Phase 3: 2013-18:** During the third and final phase, launched in July 2012, the stimulus resulting from faster growth in agricultural production from RSSP 2 is to provide the basis for promoting diversification of economic activities in rural areas as a way of increasing and stabilizing rural incomes. The current ISR ratings at the time of submitting this ICR (April 2013) are Satisfactory for both DO and IP.

6. RSSP 2 (2008-13, US$35 million IDA credit) became effective in September 2008 and completed in October 2012. Building upon the institutional, technical, and human capacity created in RSSP 1 to support the adoption of sustainable intensification technologies in developed marshlands and surrounding hillsides, RSSP 2 focused on increasing agricultural production and marketing in the marshlands and hillsides of targeted areas. The sound project design and effective implementation—involving marshland rehabilitation (an additional 3,324 ha of irrigated marshland),[6] hillside development (benefitting 10,000 ha), and the creation and strengthening of 81 cooperatives—created positive synergies between project components. Those synergies enhanced implementation and the effectiveness of the results chain. They grew stronger and otherwise benefited from a positive policy and institutional environment, championed by the Minister of MINAGRI and members of a proactive and supportive Program Advisory Committee (PAC).

7. **Rationale for Bank Involvement**. The World Bank supported RSSP 2 because: (i) Government's vision for agriculture matched the World Bank's priorities; (ii) GoR had

[5] GoR's *Vision 2020* Strategy (2002-20);); *National Agricultural Policy* (2005); *Economic Development and Poverty Reduction Strategy* (EDPRS, 2008-12); and *Second Strategic Plan for Agricultural Transformation* (PSTA 2, 2008-12).

[6] This also included construction of 8 dams, 164 km of primary canals, 160 km of secondary canals, 70 km of drainage canals, and 44 km of access roads.

demonstrated a clear vision and commitment to developing its agricultural sector through the development of coherent, complementary policies and strategies and support of the RSSP APL series; (iii) as lead donor and co-chair of the Agriculture Sector Working Group, the Bank played a crucial role in harmonizing development partners' efforts; (iv) GoR specifically requested continued Bank support for the sustainable development of marshlands and surrounding hillsides; and (v) the operation was conceived as the second phase of the successful RSSP 1 operation.

1.2 Original Program and Project Development Objectives and Key Indicators

8. **Programmatic objective**. The long-term programmatic objective of the RSSP APL series is to help GoR achieve its strategic goal of unlocking rural growth in order to increase incomes and reduce poverty.

9. **The RSSP APL series has three Overall Program Indicators (OPIs),** which are to be measured at the end of each phase and tracked as part of the monitoring and evaluation (M&E) system. The OPIs are:

- change in the average level of household incomes among Program direct beneficiary households (income growth objective);
- change in the percentage of Program direct beneficiary households under the poverty line (poverty reduction objective); and
- change in the average level of rice yields per hectare in districts[7] having marshlands rehabilitated or developed by the Program (productivity growth objective).

10. **The Project Development Objective (PDO) of RSSP Phase 2** was to increase agricultural production and marketing in marshland and hillside areas targeted for development under the project in an environmentally sustainable manner. To achieve this objective, the project was to extend and deepen the technical and institutional support generated in RSSP 1 and raise the level of investment activities to accelerate the pace of intensification and commercialization of agricultural production. Key Indicators[8] linked to the PDO were:

- by the end of the Project, production of rice in marshlands rehabilitated or developed under RSSP 2 has increased by 100 percent relative to the baseline;
- by the end of the Project, 50 percent of farmers in marshland and hillside areas developed or rehabilitated by RSSP 1 and RSSP 2 have adopted sustainable marshland or hillside intensification technologies;[9] and
- by the end of the Project, at least 20 cooperatives having quality business plans and being supported by RSSP 2 have increased their revenues from sales by 50 percent relative to the baseline.

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[7] The project is monitoring rice yields at the district level for reporting on indicator 3 of the RSSP Program and at the beneficiary level for RSSP 2.

[8] These indicators were to be measured by annual review of MINAGRI statistics, annual beneficiary surveys, and data and reports from cooperatives.

[9] Adoption of sustainable intensification technologies is defined for the purpose of the RSSP as adoption of at least two of the following practices: soil fertility management (including appropriate use of organic and/or inorganic fertilizer), integrated pest management (IPM), conservation tillage, contour bunding, construction of erosion control structures including terraces, vegetation strips, and agroforestry practices.

1.3 Revised PDO and Key Indicators, and reasons/justification

11. The PDO was not revised during the project.

1.4 Main Beneficiaries

12. The project had two direct beneficiary groups (and the avenues through which they were assisted): *farmers* in the project areas (81,629 households) (through better cropping and post-harvest activities, higher productivity, and ultimately higher incomes for further productive investments); and *farmer organizations* in the project area (81 cooperatives and 22 Water User Associations, WUAs) (though capacity building and institutional support).

1.5 Original Components

13. **Component 1: Marshlands and hillsides rehabilitation and development** *(Original Cost: US$ 26.5 million; Actual Cost: US$ 27.1 million).* This component sought to accelerate agricultural intensification by expanding irrigated area in cultivated marshlands and increasing the use of sustainable land management practices on associated hillsides. The main activities included rehabilitating and/or developing irrigation infrastructure on at least 3,300 ha of marshland and supporting the adoption of sustainable agricultural intensification practices on at least 9,900 ha of surrounding hillsides. The component was organized around two main subcomponents. Specific task (subcomponents) undertaken included:

- marshlands rehabilitation and development, including support for rehabilitation and development of gravity irrigation schemes in various marshlands selected by District Government authorities based on predefined criteria (the projected economic rate of return, evidence of commitment from beneficiaries, contribution to national food security, and likely sustainable social and environmental impacts); and
- sustainable development of hillsides to improve the productivity of farming systems on hillsides adjacent to the marshlands where irrigation schemes were developed. This subcomponent financed the promotion of soil and water conservation technologies and sustainable cropping practices on the hillsides.

14. **Component 2. Strengthening commodity chains** *(Original Cost: US$ 5.5 million; Actual Cost: US$ 5.3 million).* The objective of Component 2 was to support the commercialization of smallholder agriculture in targeted marshland and hillside areas by diversifying and intensifying production, promoting agricultural value addition, and expanding access to markets. This component used a commodity chain approach, supporting rural entrepreneurs and assisting cooperatives to adopt sound business practices. The component had four subcomponents. Specific task (subcomponents) undertaken included:

- strengthening farmer organizations and cooperatives to improve their governance mechanisms and instilling sound business practices;
- improving production technologies to improve production and productivity of marshland and hillside farming systems;
- rural investments for economic infrastructure for farmer organizations, cooperatives, non-governmental organizations (NGOs), and districts for strategic investments in public goods and services (community grain drying and storage facilities, rural roads); and

- knowledge generation and dissemination that supported diagnostic studies, market surveys, and problem-focused applied research.

15. **Component 3. Project coordination and support** *(Original Cost US$ 6.3 million; Actual Cost: US$ 6.6 million).* This component supported the Project Support and Coordination Unit (PSCU) to ensure: (i) efficient execution of administrative, financial management, and procurement functions; (ii) coordination of project activities among the various stakeholders; (iii) timely implementation and monitoring of environmental and land-use management frameworks mandated by World Bank safeguards policies; and (iv) establishment and operation of the M&E system.

1.6 Revised Components

16. The components were not revised during the project.

1.7 Other Significant Changes

17. Two significant changes arose during implementation—a financing gap and the merger of the project's PSCU with another project's PSCU (becoming the Special Project Implementation Unit, SPIU)—but did not lead to a revision of the project's objectives and targets. *Financing gap*. At MTR, a financing gap of (US$ 5.2 million) had emerged for Component 1 resulting from: unforeseen increases in local fuel prices and construction material; rising competition throughout Rwanda for construction services, which raised bid prices; changes in the SDR/US dollar exchange rate; and underestimation of physical and price contingencies (at only 0.2 percent of estimated project costs). Options to cover the financing gap were identified during the MTR mission and a joint decision taken to use cost savings from the Strengthening Commodity Chains component, select lower-cost irrigation schemes, and increase Government's contribution. *Merger of PSCUs*. The last year of RSSP 2 saw a smooth, gradual merger (initiated in May 2011 and completed in January 2012) of implementation units for RSSP 2 and a companion Bank-funded project, the Land Husbandry, Water Harvesting, and Hillside Irrigation Project (LWH) into a SPIU. The merger was part of MINAGRI's initiative to consolidate and harmonize implementation arrangements for all donor-supported projects. This government-initiated merger contributed to the project's sustainability objectives in the sector. Additionally, the SPIU implementation arrangements were designed to support the eventual transition of responsibilities from the SPIU to government ministries and agencies, as they developed sufficient capacity. The agreed changes were sound; responded to exogenous factors; enhanced management, technical, and implementation efficiencies; and enhanced project outcomes.

2. Key Factors Affecting Implementation and Outcomes

2.1 Project Preparation, Design, and Quality at Entry

18. Project design and preparation were well thought out, comprehensive, and responsive to the strategic context and led to effective implementation and achievement of key outcomes. The preparation process benefited from updated national policies and strategies (EDPRS, the operational strategies emerging from PSTA 2)[10] and Government's strong commitment for a

[10] The Economic Development and Poverty Reduction Strategy and second Plan Stratégique pour la Transformation Agricole.

second phase. The design benefited from lessons from phase 1, a sound and coherent results approach and framework, an appropriate balance among investments and capacity building, specific attention to the development of commodity chains, and institutional arrangements.

19. **Adequacy of Government Commitment**. The government demonstrated strong ownership for Phase 2, as shown by how authorities at the central and local levels cooperated with and strongly supported the government-led preparatory work, including technical studies funded by a Policy and Human Resources Development (PHRD) grant. Government exhibited willingness to meet more rigorous safeguard requirements and agreed to introduce, legally formalize, and operationalize WUAs. Credit effectiveness was achieved within three months of approval. GoR budgeted resources to fully fund activities for each year of the project.

20. **Lessons Learned from RSSP 1**. Five key lessons from phase 1 were considered in designing the second phase. First, design a simple project with 2-3 straightforward components and maintain a tight focus on an implementation plan that is manageable, given the capacity constraints under which the project operates. Second, develop and consistently apply clearly defined criteria—technical, economic, social, and environmental—to guide the selection of marshlands to be rehabilitated or developed by the project. Third, build capacity among project beneficiaries (specifically, cooperatives) early in the project and sustain that effort throughout the project. Fourth, build capacity in the PSCU/SPIU to ensure effective implementation of the four safeguards policies triggered by RSSP 2 (OP/BP 4.01, OP/BP 4.04, OP/BP 4.09, OP 4.12). Finally, review the objectives, design, and institutional arrangements of the Rural Investment Facility (RIF) created and financed in RSSP 1.

21. **Alignment of Results Framework.** The project results framework and performance indicators were aligned with key indicators in the EDPRS monitoring matrix, PSTA 2, and the common performance assessment framework. The results framework was based on a clearly defined PDO and supported by measureable performance indicators at the higher and intermediate levels, and it guided the design of the results chain, in which activities in each component and subcomponent contributed directly to the envisioned outcomes and impacts.

22. **Investment/Capacity Building Balance**. The design determined the right balance and sequence for infrastructure investments and capacity development for participating cooperatives, and it created appropriate linkages between and among project components/subcomponents. RSSP 2 preparation highlighted that many cooperatives from RSSP 1 were not functioning effectively and required strengthening for the project to succeed and its benefits to be sustained.[11] RSSP 2 funded the strengthening of cooperatives at almost twice the level of RSSP 1 and refined the timing of those activities. Greater support and increased technology transfer helped expand the scope and sustainability of project benefits. For example, members of cooperatives had better access to improved agricultural technology, to project-funded post-harvest drying and storage infrastructure, to finance from local banks for inputs and capital investments, and to enhanced marketing outlets for their larger volumes of produce.

[11] As noted, a vital lesson from RSSP 1 was to develop capacity in the cooperatives upfront—especially capacity to improve business plans, financial management, and accountability.

23. **Commodity Chain Development**. Building on RSSP 1, RSSP 2 strengthened approaches to developing commodity chains for leading food staples (rice, maize, bananas) and in parallel promoted market opportunities emerging for niche commodities such as Irish potatoes, wheat, and vegetables. The project supported farmer organizations from post-harvest handling to the expansion of agro-processing and participation in marketing systems and activities. This work proved critical to achieving the project's development objectives, as part of the results chain to the higher-level objectives.

24. **Implementation Arrangement Design**. Implementation arrangements were satisfactorily designed. They built on the successful arrangements for RSSP 1 and added some additional innovations, including: further decentralization of project staff involved in procurement and M&E to the district level; stronger linkages with MINAGRI agencies at the field level to sustain the project's benefits (especially involving technology transfer); the introduction and strengthening of WUAs, which are playing a key role in sustaining irrigation benefits; enhanced approaches to developing capacity in cooperatives with a strong business orientation and enhanced accountability/governance mechanisms, including procurement committees.

2.2 Implementation

25. Project implementation was highly satisfactory, leading to key achievements in marshland rehabilitation, hillside development, and strengthening of agricultural cooperatives. Several enabling factors led to these accomplishments, even given the initial delays resulting from exogenous factors. The project became effective within three months of approval. Upon effectiveness, the PSCU moved expeditiously to contract works. Some of these early works were facilitated by the timely availability (by effectiveness) of technical studies for 10 marshland schemes (covering 3,072 ha), funded by RSSP 1.

26. **Key Achievements and Enabling Factors**. The project design and implementation facilitated a mix of investments/"hardware" and capacity building/"software" interventions which resulted in an additional 3,324 ha of irrigated marshland being rehabilitated (this also included construction of 8 dams, 164 km of primary canals, 160 km of secondary canals, 70 km of drainage canals, and 44 km of access roads), hillside development (benefitting 10,000 ha), and the creation and strengthening of 81 cooperatives. Key enabling factors that led to these achievements included:

- reform of the cooperatives law, which improved the establishment (membership criteria), organization, functioning, and management (including stringent audit requirements) of cooperatives to make them more transparent and viable;
- the rice marketing study conducted under RSSP 2, which contributed to MINAGRI's formulation and Cabinet approval of an enhanced rice processing and marketing policy. The policy promoted higher standards for rice quality and resulted in better market prices for paddy;[12]
- The Cabinet-approved policy (2011) to establish WUAs; and

[12] Rwanda has been a net importer of rice and has a policy of achieving rice self-sufficiency by the year 2017. The country is on-track as 70 percent of internal rice consumption was covered by national production in 2012.

- the project's institutional support through 20 local service providers (LSPs), which were selected and trained to impart intensive, customized capacity building in business practices, financial accountability, and agricultural technology to cooperatives and farmers.

27. **Marketing/Value Chains.** To create a viable model for expanding agricultural commercialization, the project implemented specific activities in the upper (production) segment of the commodity chain to link beneficiary farmers with more organized, profitable arrangements to market their significantly increased volumes of produce (especially rice, maize, bananas, and vegetables).

28. **Capacity Development.** Multi-layered training targeted different types of beneficiaries within the cooperatives. This results-focused training developed the foundation for a production and marketing system superior to the traditional, subsistence-oriented system prevailing before the project. The impact of this new system on cooperatives was evident in better management structures, computerized production data and membership information, employment creation (479 full-time and 706 part-time jobs), development of operational strategic plans as a framework for commodity-specific business plans, tools to achieve improved efficiencies and competitiveness, strategies and business plans that promoted viable value-added enterprises, and a stronger business orientation to customers (versus products alone). Improvements in infrastructure, coupled with appropriate intensive training and improved agricultural technologies and inputs, fostered high rates of adoption (98 percent) of specific improved technologies, rapid increases in crop productivity and yields (rice yield increase from 2.7 t/ha to 5.7 t/ha within participating districts and to 6.7 t/ha for direct beneficiaries), farm and income diversification (for example, the introduction of livestock and fishery activities), and resulting higher farm incomes (more than 100 percent for many beneficiaries).

29. **Initial implementation delays.** Initial delays resulted from: (i) flooding, which delayed contractors' work in some schemes; (ii) lack of equipment among some contractors; and (iii) a delay in strengthening WUAs, which could not legally form until Parliament had passed a law to that effect (activities to strengthen WUAs commenced at the MTR, in preparation for the law's passage, which occurred more than mid-way through implementation). Although these delays were out of the project's control, they were resolved sufficiently and rapidly that the project completed its activities 12 months before closing.

30. The Quality Assurance Group (QAG) had not reviewed this project at entry or during implementation. QAG carried out a Governance and Anti-corruption assessment in FY08, essentially as a baseline. There has been no follow-up assessment.

2.3 Monitoring and Evaluation (M&E) Design, Implementation, and Utilization

31. **M&E Design.** The design of RSSP 2's M&E system was sound, building on the challenges and lessons from RSSP 1 and on a well-prepared, coherent results and monitoring framework allowing effective monitoring of progress toward the PDO using effective collection methods. The system featured generally clear and prioritized indicators (at each level in the results chain); employed cost-effective and reliable data collection methods, systems, processes, and arrangements; and was decentralized and participatory, involving district-level M&E officers and cooperative officers with some basic M&E skills. The results framework and supporting

indicators reflected a sound link between the PDO and intermediate outcomes and responded to priority sectoral constraints. It was explicitly aligned with and contributed to key agricultural sector objectives and performance indicators outlined in the EDPRS and PSTA 1 and 2, and with the M&E system of MINAGRI and MINECOFIN (the Ministry of Finance and Economic Planning).

32. Two shortcomings in M&E design for RSSP 2 were improved during implementation and are being further improved under RSSP 3. The project's marketing objective lacked well-defined performance indicators, although the M&E system includes a number of proxy indicators. Nor did the project provide sufficiently robust, results-focused performance indicators for the cooperatives it strengthened. Cooperatives' performance was measured by increases in their revenues only, which may not accurately measure net profitability and efficiency, including cooperatives' effectiveness in engaging and efficiently negotiating in input and output marketing. RSSP 3 incorporates and tracks additional indicators on cooperative performance and marketing to strengthen and evaluate the sustainability of cooperatives.[13]

33. **M&E Implementation**. M&E implementation was facilitated by the collection of appropriate data using appropriate methods and was enabled by the following key factors:

- the M&E system was well designed to track key activities and develop quarterly and annual reports on performance targets and progress toward triggers for Phase 3;
- the PSCU benefitted from continuity in the competent, experienced M&E staff recruited following the MTR for RSSP 1. The Bank's M&E specialist in Kigali offered responsive technical advisory support;
- participants in the project's decentralized M&E system provided reliable data, including cooperatives (each had a focal person trained in basic M&E skills) and MINAGRI (crop assessment data); and
- independent evaluations focused on strategic themes including: commodity chain and other technical studies to sharpen Component 2 interventions (especially for rice); a mid-term report (2010); the Oxford Policy Management (OPM) final evaluation report updating performance indicators and impact assessment; and Government's ICR.

34. **M&E Utilization**. Key actors confirm the usefulness, reliability, and value-added of information from the project's M&E system to inform decision-making and resource allocation. For example, weekly presentations by the M&E team facilitated focused, timely management decisions based on real-time physical and budget implementation. The dashboard and procurement reports alerted project management and staff to progress and issues requiring timely resolution; the reports also proved valuable to Bank supervision missions. The quarterly and annual reports were used by: MINAGRI management to inform project planning and oversight needs; MINECOFIN/CEPEX officials for their project performance reports and high-level quarterly reviews; the Prime Minister's Office for project/policy monitoring; and the Bank task teams as key inputs for supervision/implementation missions. Innovative "results stories" presented beneficiaries' accounts of how the project had affected their lives; the stories were disseminated widely in a range of formats, including nationally televised video segments.

[13] The new indicators cover value-added activities, increased production, percentage marketed, profit levels, dividends distributed, access to finance, investments, and cooperative turnover in sales. Based on the initial information gathered in RSSP 3, many of the cooperatives are demonstrating positive performance in terms of these more robust indicators.

35. SPIU continues to improve the design, implementation, and use of the M&E system in RSSP 3. For example, it is reinforcing capacity at the district, cooperative, and self-help group levels to sustain the M&E system at the field level, maintain the focus on results, and provide information throughout the cropping season for MINAGRI and cooperatives.

2.4 Safeguard and Fiduciary Compliance

36. **Safeguards**. Compliance with environmental safeguards was rated satisfactory throughout the life of the project. The project's design raised no significant environmental concerns. During implementation, the project improved comprehensive watershed management in the target areas. The rating for social safeguards throughout the project was satisfactory, with two exceptions. The social safeguards mainly emphasized the resettlement and compensation of people affected by rehabilitation of marshlands. Initial compliance with social safeguards was complicated by the project's relative unfamiliarity with their implementation, the late assignment of PSCU responsibilities for resettlement activities, and high turnover among district authorities. These factors could have been serious but in practice caused only minor delays because the PSCU/SPIU team assessed the situation correctly and took timely decisions in consultation with district authorities.

37. **Financial Management**. Over the life of RSSP 2, the Financial Management (FM) unit in the PSCU/SPIU performed consistently well, implementing all FM recommendations outlined in the PAD. The unit (which carried over from RSSP 1) was adequately staffed at inception (five persons). Aided by strong project leadership and proactive management, the 2011 merger of the RSSP 2 and LWH PSCUs into one SPIU increased the complement of FM staff to eight, created economies of scale, and further improved the delivery of FM services. All of the project's 16 unaudited interim financial reports were submitted to the Bank on time. All 8 supervision missions awarded the project a "satisfactory" rating for FM. The Bank received all 5 audit reports within 6 months of the end of the financial year, and all were unqualified.

38. **Project Disbursement**. Project disbursement was satisfactory. Initial delays in disbursement were occasioned by contract delays. Disbursement maintained the pace and trajectory of initial estimates despite lagging about 15 percent behind projections. By the end of 2011 (year 4), the project reached 96 percent of disbursements. By closing (October 31, 2012), the project had disbursed 100 percent of the original allocation of SDR 21.3 million, without utilizing the standard 4-month grace period to fully disburse and document the credit. Over the lifetime of the project, regular monthly withdrawal applications were submitted by the PSCU/SPIU to the Bank on a timely basis.

39. **Procurement.** Procurement performance was generally satisfactory, building on the sound procurement design and effective implementation. Procurement also demonstrably improved during implementation. Annex 2 describes the constraints that delayed some of the initial contracts and explains how they were overcome after the first year. Annex 2 also details improvements in managing and monitoring contracts.

2.5 Post-completion Operation/Next Phase

40. **Transition Phase**. Given that RSSP 2 finished implementing physical activities about one year ahead of schedule and meeting the triggers for RSSP 3 by the end of 2011, the transition period was advanced and was used to consolidate results, ensure the quality of the infrastructure developed under the project, and build soft skills among cooperatives and other beneficiaries. In early 2011, GoR requested the Bank to bring forward and speed up preparation and processing of RSSP 3. A combined supervision and RSSP 3 preparation mission in September 2011 helped lay the groundwork to close RSSP 2 smoothly, update the work plan, and transition seamlessly to RSSP 3. The transition included expediting the independent impact assessment (confirming that RSSP 3 triggers had been met), drafting Government's ICR, and advancing technical studies and other preparatory work for RSSP 3 (funded by RSSP 2). Appraisal of RSSP 3 was completed in January 2012; the project was approved by the Bank's Board in March 2012 and declared effective on June 20, 2012.

41. Since the RSSP 2 and RSSP 3 SPIU team and implementation arrangements were one and the same, they assured a smooth transition. Building on the results and momentum from RSSP 2, RSSP 3 has had a strong start since it became effective in June 2012, disbursing 16 percent of its resources in the first eight months. It has launched a number of works and studies and successfully organized 11,584 hillside farmers in small groups. It is ahead of schedule to achieve key outcomes and objectives.

42. **Key Changes for RSSP 3**. RSSP 3 incorporates two key changes based on lessons from RSSP 2. First, WUAs are being established and strengthened at the start of irrigation works. This approach instills ownership and understanding of the irrigation schemes—of how they function and of the roles and responsibilities of all water users. The approach also reinforces the need to operate and maintain the infrastructure (a public good) properly and to separate that responsibility from the cooperative, which essentially engages in private productive and entrepreneurial activities. Second, instead of working with multiple hillside cooperatives spread throughout the country, RSSP 3 is adopting the more targeted and approach of establishing and strengthening cooperatives on the hillsides that surround RSSP 3 marshlands. RSSP 3 is also strengthening a few cooperatives that entered RSSP 2 towards the end of the project.

43. **Sustainability of Project Impacts**. The GoR has specific arrangements to sustain the impacts of RSSP 2. In addition to pursuing RSSP 3, Government is maintaining a favorable policy and institutional environment, replicating the marshland and hillside investment model, maintaining high adoption rates, and strengthening the operation of viable cooperatives.

44. *Policy environment*. During RSSP 2, with support from the project, GoR revamped policies associated with marshland development and rehabilitation. It devised a national rice development strategy in September 2011 and instituted a Ministerial Instruction on rice processing and trading in June 2011. Today GoR is enforcing processing standards for locally produced and imported rice. The System of Rice Intensification (SRI) was rolled out on all RSSP marshlands in the same year. The Water Users Association Ministerial Order (passed by the Cabinet and gazetted in September 2011) requires all irrigation schemes in Rwanda to establish WUAs. Long-term maintenance is being financed through WUAs' contributions to a district irrigation reserve fund and a national irrigation trust fund. Through the Rwanda Cooperative Agency (RCA), GoR also revised the cooperatives law (to be gazetted) to raise the requirements

for establishing cooperatives. The revised law specifies the number and relationship of members and requires quarterly audits by external professional auditors.

45. *Institutional environment*. GoR has implemented a results-based delivery model, whereby project management teams translate their annual work plans into performance contracts signed with the ministry. The same results have to appear in the performance contacts that District Mayors sign with the President. The Prime Minister's office actively champions the monitoring of performance contracts. For its part, MINAGRI—at the central and district levels—secured commitments from district officials to ensure that the district agronomist and cooperative development officer provide regular advisory services to the cooperatives and their farmer groups. The government also created RCA (2009) to strengthen the cooperative movement throughout the country.

46. *Marshland investment model.* GoR's target is to expand irrigated marshlands to cover 45,000 ha over the next five years by adding 23,000 ha to the 22,000 ha that have already been established. PSTA 3 will finance US$ 65 million (6,000 ha) of irrigated marshlands; the entire RSSP series will have contributed more than 12,000 ha. The enabling rice policy, vibrant national and regional rice markets, and capacity of Rwandan producers to compete with rice imports generated during RSSP 2 all favor expanding irrigation investments in Rwanda. Government, recognizing the benefits of irrigated agriculture, has also embarked on a program to develop more hillside irrigation infrastructure. Its target is to deliver an additional 20,000 ha of irrigated hillsides by 2018.

47. *Maintaining adoption rates.* GoR designed RSSP 2 to include relatively simple, sustainable intensification technologies that would be attractive and easy for farmers to adopt. Such interventions do not need intensive technical support. The majority cost little and furnish significantly higher yields in a short period. For example, the investments in marshland irrigation infrastructure, coupled with the use of improved seed, reliable water, and fertilizer, raised the average rice yields of direct beneficiaries from a low of 1.5 t/ha to 6.7 t/ha, within one to two years. In the districts where the project worked, the increase was from 2.7 t/ha to 5.68 t/ha. In sum, strong incentives for beneficiaries to continue using the improved technologies are built directly into the integrated package of technologies.

48. The maturing agro-dealer network will help to sustain these improvements. Dealers have received government-sponsored training in safe handling of agro-chemicals and can now bid in the auction for fertilizer that GoR imports in bulk. The agro-dealer network has national coverage, which means that it can reach more producers. To strengthen rice research and the availability of more marketable rice varieties, RSSP works at the central level with the National Research Center (Institut des Sciences Agronomiques du Rwanda), now part of the Rwanda Agricultural Board (RAB), and the project supports and maintains an active partnership with RAB to support Farmer Field Schools and institutionalize the provision of follow-up technology services. Trials of more marketable rice varieties were rolled out on all RSSP 2 marshlands. RAB establishes and maintains alliances with international research centers to disseminate new agricultural technologies to farmers. Government's sustainability strategy includes measures that will strengthen these alliances and ensure a steady flow of improved technologies.

49. *Sustaining cooperatives and WUAs.* Cooperatives and WUAs are the primary institutional mechanisms for delivering project benefits. Of 81 cooperatives (23 rice/marshlands, 58 hillsides) receiving RSSP 2 support, 94 percent (76) were functioning effectively at the end of the project. They have effective governance structures, abide by RCA audit requirements, and are increasing their capital shares. Among hillside cooperatives, 53 of 58 have strong business partnership for marketing produce and active relations with financial institutions. All 23 marshland cooperatives are making impressive progress, maintaining good levels of production, and further integrating within the value chain. Four cooperatives bought shares (as much as 40 percent) in the rice mills that serve them, and four more intend to do likewise. The majority of cooperatives have been able to pay professional managers and qualified agronomists (once supported through RSSP). Government's creation of RCA reflects its deliberate choice to strengthen the national cooperative network (about 5,000). RCA, which registers and supervises cooperatives, trains them to serve their members equitably and efficiently and empower them economically. It provides technical support for cooperatives to improve their governance and management, and in line with market-based approaches, it coaches cooperatives on establishing strong, viable linkages with formal financial institutions.

3. Assessment of Outcomes

3.1 Relevance of Objectives and Design

50. The *project's objectives* were and continue to be highly relevant in addressing and supporting central objectives and performance indicators at the country and sectoral levels. They are closely aligned with objectives outlined in the EDPRS, PSTA 2 (and emerging PSTA 3), the Bank's CAS, and the CAS Progress Report.[14] RSSP 1 and RSSP 2 were—and RSSP 3 remains—a key mechanism for Government to increase agricultural production and reduce rural poverty in marshlands and associated hillsides.

51. Additional indications of RSSP 2's relevance is that PSTA 3 gives high priority to key elements of RSSP 2, such as continued intensification of food production; expanded, economically viable marshland irrigation schemes to support food security objectives; productivity increases on hillsides (the dominant agricultural land area); increased reliance on market-based policies and strategies; and an expanded private sector role (catalyzed through public-private partnerships).

52. The *project's design and implementation* were and continue to be highly relevant for meeting its objectives, especially the focus on strengthening WUAs and on developing cooperatives through improved business practices and accountability mechanisms, expanded farmer membership and participation, and proactive advisory services in technology transfer (through lead farmers and farmer-based extension). RSSP 2's operational mechanisms and decentralized approach remain consistent with the national decentralized rural development strategy, with many implementation functions (such as community procurement, local contact monitoring, and basic M&E data collection) performed by provincial and district officers. The perception among district officials, farmers, and cooperatives that these "software" elements are

[14] See the Rwanda – Country Assistance Strategy Progress Report (February 9, 2011), especially references to progress in theme 1 (Promoting Rwanda's Economic Transformation for Sustained Growth") and Annex 2 (updated and revised CAS Outcome Indicators).

vital and have had positive impacts affirms the soundness and relevance of the project's design and implementation.

3.2 Achievement of Project Development Objectives (PDOs)

53. RSSP 2 has achieved and substantially exceeded its development objectives. *The PDO was to increase agricultural production and marketing in marshland and hillside areas targeted for development under the Project in an environmentally sustainable manner*.

54. The PDO is divided into three objectives: Ii) increase agricultural production; (ii) increase agricultural marketing; and (iii) do so in an environmentally sustainable manner. The first objective to *increase agriculture production in marshlands and hillside areas targeted for development under the project* was fully achieved and targets exceeded. There were no shortcomings. **PDO Indicator 1**: *"By the end of the project, production of rice in marshlands rehabilitated or developed under RSSP 2 has increased by at least 100 percent relative to the baseline at the aggregate project level."* The target was significantly exceeded (18,675 t vs. 11,194 t, by 167 percent). The main drivers of this significant increase in rice production were the project's marshland investments, which regulated and increased the water supply and permitted two cropping seasons, and the project's "software" support, including provision of appropriate intensification technologies and improved inputs. Before getting RSSP support, these beneficiaries were practicing subsistence farming at low levels of productivity.

55. When the figures are analyzed by cooperative, it becomes clear that of the eight cooperatives operating on reclaimed or rehabilitated marshland under RSSP 2, two—in Gisaya and Muvumba V—reported no production until season 2011B. Three of the remaining six started production only in season 2011A.[15] The other three saw a lapse in production while marshlands were rehabilitated, and they renewed production in seasons 2010B or 2011A. Nearly all of the six cooperatives obtained significantly higher yields in season 2011B than in season 2011A, which bodes well for the future. The Muvumba VIII scheme came on stream in 2012, adding significant increases in rice production. All cooperatives have continued to increase their production; some attaining yields of 7.2 t/ha (Table 3.1).

Table 3.1: Average Yields (t/ha) of RSSP 2-supported Rice Cooperatives

Marshlands	Cooperative	Yield (t/ha)	Yield (t/ha)	Yield (t/ha)	Yield (t/ha)
		Season 2011A	Season 2011B	Season 2012A	Season 2012B
Nyarubogo	Coop Nyarubogo	5.1	6.8	6.0	6.7
Kinyegenyege	Coproriz-Busoro	4.0	6.8	6.0	6.8
Rugeramigozi	Kiabr	3.0	3.0	4.3	4.3
Kibaya Cyunuzi	Copriki Cyunuzi	4.1	7.5	7.0	7.0
Kinnyogo I	Isabane	3.7	7.1	7.2	7.0
Gwagitima	Copr Ntende	4.8	7.2		6.8
Muvumba V	Coprimu		6.6	6.5	6.5
Gisaya	Cocurigi		5.4	7.0	7.0
Total/Average		**4.3**	**6.8**	**6.5**	**6.7**

Source: MINAGRI SPIU M&E Department (2012)

[15] Rwanda's Agricultural calendar has two main seasons: Season A, running from September to January and Season B, from February to June. In irrigated areas they can also have short Season C, for vegetable growing from June to September.

56. Farmers who are not project beneficiaries and who operate in non-rehabilitated marshlands have no access to irrigation, can plant only one season each year, and obtain average rice yields from 2.7 to 3.3 t/ha. Before their marshlands were developed, farmers' average annual income was RWF 347,164/ha, compared to RWF 3.6 million/ha (1.8 million/ha/season) on marshland improved or developed under the project.[16]

57. The target was appropriate, as the key driver of increasing incomes was increasing production. Increasing production by 100 percent was an ambitious goal, given that production increases from this type of investment normally range from 60 to 80 percent

58. **PDO Indicator 2**: *"By the end of the project, at least 50 percent of farmers in marshland and hillside areas developed or rehabilitated by the RSSP 1 and RSSP 2 have adopted sustainable marshland or hillside intensification technologies."*[17] Farmers' adoption of sustainable technologies was measured directly in the Impact Assessment survey (2012). By the end of the project, 98 percent of the beneficiary farmers had adopted at least two improved practices (Table 3.2).[18]

Table 3.2 Agricultural Practices and Techniques

Percentage of households using…[1]	**Treatment group**	
	Marshland	**Hillside**
Soil fertility management techniques	95.2	95.3
Integrated pest management techniques	78.9	80.9
Contour bunding	83.9	41.5
For households cultivating land on hillsides in last 12 months		
Conservation tillage techniques	29.7	36.3
Either radical or progressive terracing	14.0	21.5
Vegetative strips as an erosion control technique	88.5	92.0
Agroforestry practices as an erosion control technique	80.6	78.2

Source: RSSP2 Impact Assessment Survey 2011. Notes: (1) It is important to note that most farmers sampled from RSSP marshland cooperatives also cultivate plots in nearby hillsides, so the techniques discussed in Table 6.3 may be applied by marshland farmers either in their hillside plots or in their marshland plots.

59. The target was appropriate, given that increasing the uptake of new land intensification technologies is a critical component of increasing production and yields. The 50 percent adoption target was also a stretch, as the average range of expected adoption rates is usually between 30 to 50 percent with sustainable marshlands and hillside intensification technologies.

60. The project succeeded in increasing marketing in marshland and hillside areas as demonstrated by the increases in cooperative revenues. **PDO Indicator 3**: *"By the end of the project, at least 20 cooperatives with business plans and supported by RSSP 2 have increased their revenues from sales by 50 percent relative to the baseline."* Cooperatives' sales revenues and revenues rose by more than 50 percent for 67 cooperatives (335 percent of target) and for 18 cooperatives it rose more than 1,000 percent. Cooperatives' ability to grow and market many crops over two seasons was a major factor in the increase in revenues. Cooperatives (14) that did not increase revenues by 50 percent appear to have two main characteristics. First, 7 of those 14 cooperatives had just recently been formed and initiated strengthening activities. Based on the

[16] MINAGRI, SPIU, M&E Department (2012)
[17] Footnote 9 defines the "adoption of sustainable technology."
[18] Oxford Policy Management (OPM) Assessment Report.(Feb. 2012), Volume 2, Table 6.3.

experience of the other cooperatives, it is anticipated that within the next two seasons these cooperatives will meet and exceed the target. Second, the other 7 of the 14 cooperatives had just initiated production after the infrastructure was installed.[19]

61. The second objective of the PDO, *increase agriculture marketing in marshlands and hillside areas targeted for development under the project,* was fully achieved. All project cooperatives, on average, marketed over 70 percent of their production as a result of the cooperative collection system. This marketed share has increased steadily since 2008, when on average households marketed 35 percent of their production. The project increased cooperative capacity and marketing among 81 beneficiary cooperatives and farmer groups/associations through the hiring of professional managers, greater ownership (creating transparent management structures), and increased commitment (payment of cooperative membership fees). These results occurred with the support of project-strengthened district and central government service agencies (including RAB), which can now scale up and sustain the project's benefits. Increased marketing benefits for cooperatives are also demonstrated by increased productivity (in both marshland and hillside areas) and more diversified production (as seen in new activities like fish farming and livestock development), the increased value of production (through bulking produce and linking with potential buyers), larger marketable surpluses (through greater and more efficient input use), and higher incomes from cropping and diversified production (rising by more than 300 percent since the end of RSSP 1).

62. The third objective of the PDO, to accomplish the first two PDO objectives *in an environmentally sustainable manner,* was fully achieved, as demonstrated by the high adoption of 98 percent of the sustainable marshland or hillside intensification technologies (PDO indicator 2). The intensification technologies promoted environmental protection and enhancement and included: soil fertility management, integrated pest management (IPM), conservation tillage, contour bunding, construction of erosion control structures, including terraces and vegetative strips, and agroforestry practices. In addition, in accordance with the RSSP 2's Environmental Impact Assessment and Environmental and Social Management Framework, and in conformity with Rwandan environmental law, a vegetative buffer zone of *Pennisetum purpureum* and agroforestry species was established around all dams and water conveyance canals built by the project.

63. RSSP 2 exceeded the three PDO indicator targets, and it exceeded the target values for the six intermediate indicators aligned to the key outcomes (see Annex 2). Based on the considerations reviewed here, the efficacy is rated high.

64. RSSP 2 also substantially contributed to the long-term programmatic objective of the RSSP APL series, which is to *help GoR achieve its strategic goal of unlocking rural growth in order to increase incomes and reduce poverty.* The Oxford Policy Management (OPM) quantitative household survey for the RSSP 2 impact evaluation shows achievements and positive impacts in areas such as agricultural production (for instance, productivity increases

[19] Note that the achievement of this indicator must be interpreted carefully as there is a bias downward on performance. For rice cooperatives, it represents the *first full season* (rather than full year) in which rice cooperatives could produce a full crop after works came to an end. In many cases, that production season was limited because of timing of infrastructure completion, timing of use of increased intensification technologies and improved inputs.

exceeded 100 percent for rice, maize, and potatoes), food security (as expressed by increased income expenditure), and innovations in processing and marketing (a number of cooperatives invested in rice, maize and cassava mills and adopted better packaging and labeling of their produce). Impact is also seen in household incomes (for example, annual income derived from sales for RSSP marshlands and hillside households was RWF 232,000 (US$ 365), verses RWF 60,000 (US$ 94) among the comparison group), and employment[20] (over 16,000 people, including 7,316 workers for one year in marshland rehabilitation, 5,610 workers for six months on average in terracing, 3,500 workers for six months on average for tree nursery preparation and maintenance, and 760 workers for six months in economic infrastructure).

65. Socioeconomic well-being improved among RSSP 2 beneficiary versus non-beneficiary households. Beneficiary households are more likely to own key household durables (mobile phones, beds, and bicycles, for instance), have better access to electricity, and pay for health insurance. Stakeholder consultations during the ICR mission confirmed that beneficiaries' perceptions of improved well-being were consistent with the survey findings. The mass of evidence supports the assertion that RSSP 2 was well aligned with and contributed to RSSP's long-term development objective as well as to national and sectoral strategies and their key performance targets.[21]

66. Other indicators of enhanced well-being of project beneficiaries, for which RSSP 2 has contribute to, include better access to health insurance (5–10 percent) than non-beneficiaries and ownership of durable goods (up to 57 percent of RSSP 2 beneficiaries owned a mobile phone versus 39 percent of people in non-project communities; and up to 33 percent of RSSP 2 beneficiaries owned a bicycle versus 14.6 percent among other rural Rwandans). The stakeholder consultations during the ICR mission confirmed beneficiary perceptions which are consistent with these survey findings.[22]

3.3 Efficiency

67. The economic analysis included the US$ 32.8 million IDA project funding, as well as US$ 4.4 million provided by the GoR and an estimated US$ 2 million in beneficiary contributions. A 21-year discounted cash flow model was used to assess the economic and financial prospects of the project in 2008 prices (time of appraisal). The analysis focused on the net present value (NPV) of project benefits and costs and the resulting economic rates of return (ERR) for the overall project and key components/subcomponents. Annual benefits and costs of marshland and hillside developments were calculated using representative farm models aggregated up to the project level. Similarly, annual returns on rural infrastructure investments were calculated for representative post-harvest infrastructure (drying bays and storage facilities at the community level) and aggregated to the project level.

68. Secondary effects were analyzed, given the evidence that project beneficiaries are engaging in cow production and fisheries because of higher incomes induced by the project. Representative models were developed for fisheries in project-provided irrigation dams and cow

[20] MINAGARI, SPIU, M&E Department (2012).
[21] OPM Assessment Report (Feb. 2012), Volume 2. Also, see Annex 2 for detailed review of progress toward overall RSSP Program indicators.
[22] OPM Assessment Report (Feb. 2012), Volume 2.

production on hillsides and then aggregated to the project level. This analysis did not include benefits generated by the project-supported activities that could be transferred outside the project area through trained farmers interacting with other communities (these spillover effects appear to be important but were not monitored). Still other project-induced production activities generated important benefits to participating cooperatives and their members. Examples include keeping bees and raising rabbits (introduced in project communities), using straw from paddy fields as fodder for cows and organic fertilizer for crops, and using rabbit manure as fish feed. Benefits are also expected to extend beyond the 21-year time-frame of this analysis.

69. The main drivers of this significant increase in rice production were the project's marshland investments in irrigation and drainage infrastructure which induced the returns above initial expectations. This infrastructure regulated and increased the water supply and permitted two cropping seasons, and the project's "software" support, including provision of appropriate intensification technologies and improved inputs. Before getting RSSP support, these beneficiaries were practicing subsistence farming at low levels of productivity. Additionally, the project benefited from the nationwide Crop Intensification Program launched in 2008 which provided access to improved inputs including fertilizer and seeds at bulk prices and on credit to be repaid at the end of the season. This program came into existence during RSSP 2 and had unanticipated positive knock-on effects.

70. *The financial and economic returns from the project's investments and other activities were very positive.* The economic NPV of RWF 57 billion (US$ 90 million), with an ERR of 47 percent, compares favorably to the economic NPV estimated at appraisal of RWF 25 billion, with an ERR of 34 percent. The financial NPV of RWF 65 billion (US$ 140 million) is higher than the economic NPV because of adjustments for import duties and fertilizer subsidies.

71. On average, economic ERRs for similar types of agriculture projects are typically around 12 percent, with highs up to 30 percent. RSSP 2's ERR of 47 percent was significant owing to the drivers of growth addressed previously. Additionally, the project was catalytic in facilitating additional economic benefits to beneficiaries. The project-induced net benefits from fisheries and cows amounted to RWF 1.5 billion and RWF 27 billion, respectively. When these benefits[23] are included in the analysis, the NPV is RWF 85 billion (US$ 135 million), mainly because of higher yields and output prices for the hillside developments, with an ERR of 91 percent.

72. *Because the project exceeded its target with respect to the number of hectares developed on marshlands and hillsides, there were no missed opportunities.* As noted, the project achieved an impressive farmer technology adoption rate of 98 percent after four years, as monitored and verified by the project's M&E system and OPM Impact Assessment, and there is evidence that these technology improvements will be sustained by farmers.

73. *Capacity-building activities for cooperatives enabled farmers to further increase their yields, increase their ability to obtain higher output prices, reduce input use without losing yield or price advantages, and increase their ability to purchase inputs at a lower cost.* Although not

[23] These unforeseen benefits were not included in the appraisal analysis but are included here because of the updated information that was available and results observed among project beneficiaries.

quantified in this analysis, it also enabled them to embark on profitable enterprises, as they diversified and expanded their value chains.

74. *Total project returns are not very sensitive to changes in assumptions,* but returns on the marshland subcomponent could be erased with a 4 percent fall in the price/yield of paddy or a 14 percent increase in investment costs. The economic NPV on the rural infrastructure subcomponent was RWF 2.4 billion and would have been zero if the paddy rice price fell by more than 28 percent.

75. *Results of the analysis have several strategic implications.* First, it appears that the project somewhat underinvested in hillside rehabilitation vis-à-vis marshland development, given the latter's much higher investment costs. However, experience from the LWH project also suggests that actual hillside investments using more comprehensive and sustainable technologies are more costly than those in RSSP 2. At the same time, many farmers seem to have adopted the improved practices *after* they had experienced or witnessed substantial increased incomes from the marshland schemes. Finding the right balance in these types of investments will be important in future scaling-up efforts. Second, substantial fishery and cow production benefits (manure, fodder, straw, and other byproducts) with negligible investment and recurrent costs arise from the higher incomes induced by the project through marshland and hillside development. It will be essential for RSSP 3 to capture reliable data on fishery and cow production and marketing. It is also important to ensure that cooperatives and individual beneficiaries can pursue efficient marketing channels for the products associated with these enterprises to reap the maximum potential benefits. Finally, there is scope to scale up the benefits to non-beneficiary areas and cooperatives, given the larger objective of reducing rural poverty.

76. The project was successful at increasing production and productivity principally because of key infrastructure investments which increased water supply; limited capacity and production cooperatives at project start-up and a sharp focus on and strengthening of a limited number of cooperatives that quickly matured in marketing production capacity and capacity to effectively manage their cooperatives; most land was underutilized or unproductive and providing minimal returns on investment previous to the project; provision of improved inputs and technologies; significant financial benefits from second investments (cattle and fisheries); and the project built upon strong and capable management capacity established in RSSP 1 at the ministerial and project coordination level.

77. Based on the above evidence, overall ***efficiency is rated Substantial***.

3.4 Justification of Overall Outcome Rating - *Rating: Highly Satisfactory*

78. Overall outcome is rated Highly Satisfactory based on the high relevance of project objectives and component design, the quality of implementation, and the likely sustainability of outcomes. There were no shortcomings in the achievement of objectives. Targets were exceeded, and efficiency was substantial.

3.5 Overarching Themes, Other Outcomes, and Impacts

79. **Poverty and Equity Impacts.** RSSP 2 contributed to poverty reduction through increased crop productivity, farm enterprise diversification, enhanced and private sector-driven

marketing, and increased food security. All of these effects contributed directly to significant increases in household incomes (benefiting about 81,629 households, with a range of incremental benefits), and enhanced indicators of well-being. The quantitative household survey (of about 1,300 households and a comparator group) showed expanded access to social services and improved living conditions for beneficiaries, as evidenced by rising incomes, increased capacity to pay for school fees and health insurance, renovated houses, and other indicators of enhanced well-being.[24] In addition, whereas 66 percent of rural households were below the poverty line for Rwanda, by the end of 2011 it is estimated that 39.3 percent of RSSP 2 beneficiary households were below the poverty line. Using data from the EICV3 household survey, it is estimated that about 46 percent of non-beneficiary households are below the poverty line, showing that a significant degree of poverty reduction can be attributed to RSSP 2 interventions.[25]

80. RSSP 2 also promoted actions that contributed to equitable benefits, including: (i) giving preference to landless farmers when selecting prospective beneficiaries for irrigated plots in marshland schemes; (ii) limiting plots to an average of 0.2 ha per farmer (except for plots that form part of the Muvumba VIII marshland scheme, which had sufficient water and land to benefit a larger area, and thereby further enhance the poverty impact); (iii) encouraging beneficiary cooperatives to reduce barriers to membership (for example, by reducing and deferring payment of membership fees); (iv) promoting socioeconomic and gender diversity on the various project-induced, community-based committees and groups (including lead farmers, cooperative officers, WUA members); (v) promoting demonstration effects of the incremental benefits of adopting enhanced technologies for hillside plots for nearby non-beneficiary farmers (spillover benefits); and (vii) using RSSP 3's M&E system to monitor cooperative participation, key performance indicators, and beneficiary income increases. No evidence of "elite capture" of project benefits was found by the OPM study and the ICR mission stakeholder consultations.

81. **Gender Balance**. RSSP 2 generated positive gender benefits in several ways. It promoted gender-balanced access to project benefits (such as infrastructure investments and access to training) and institutions (cooperative officers and members of resource, WUA, and accountability committees). The RSSP 2 monitoring system included several gender-specific indicators to track and ensure gender balance. Table 3.3 provides the numbers of direct beneficiaries by project component and subcomponent, showing a beneficiary allocation pattern of about 40–60 percent (women to men beneficiaries, respectively) for most subcomponents.

Table 3.3: Beneficiaries by Subcomponent and Gender

RSSP 2 Subcomponent	Women	Men	Total	Women (%)
Marshland rehabilitation and development	13,839	20,764	34,603	40
Hillside rehabilitation and development	13,839	20,764	34,603	40
Strengthening farmer organizations and coops	35,409	46,220	81,629	43
Improving production technologies	35,409	46,220	81,629	43
Investments for agribusiness	3,688	5,016	8,704	43
Knowledge generation and dissemination	35,409	46,220	81,629	43

Source: MINAGRI SPIU M&E System (2012).

[24] For further details, see Annex 5 and OPM's Volume 2 of the Assessment Report (Feb., 2012). The comparator group is based on the results of the National Integrated Household Living Conditions Survey, known as the EICV3.

[25] The baseline value for the poverty indicator is taken from the impact assessment of RSSP 1. The equivalent figure for 2010/11 from EICV3 data is 39.3 percent. The 45 percent figure for non-beneficiary households below the poverty line is also taken from the 2010/11 EICV3 survey data. In the event that more recent poverty/income data become available, it is likely that the poverty reduction differential will be greater.

82. **Institutional Change and Strengthening.** RSSP 2 provided substantial capacity development for participating cooperatives and WUAs and strengthened the institutions and personnel who provide support services to them (such as agronomists, irrigation engineers, cooperative development officers, and field-based RAB services that provide a continuous flow of agricultural technologies). The project expanded the farmer clientele for local banks, which now offer a greater range of financing services.

83. **Other Unintended Outcomes and Impacts.** The extent and scope of the incremental production and marketing benefits of livestock and fisheries, the emerging multiplier effects of increased incomes and other project benefits, and higher fiscal revenues in the surrounding local areas were unplanned benefits. Anecdotal evidence, including highly positive feedback from numerous district officials, seems to suggest that these multiplier effects could be sizeable over time and are worth monitoring and evaluating during RSSP 3. Almost all beneficiaries were able to pay their fees for the Mutuelle de Santé (local health insurance scheme), and many achieved higher incomes by obtaining other sources of income (motorcycles to use as taxis, for example). Some even acquired household electricity connections (the Mukunguri Cooperative financed an 11-kilometer electrical line to their marshland).

3.6 Summary of Findings of Beneficiary Survey and Stakeholder Workshops/Consultations

84. The RSSP 2 ICR exercise benefited from several beneficiary and stakeholder consultations, which generated specific feedback from a wide range of project participants. The OPM RSSP 2 assessment survey, for example, carried out a comprehensive qualitative and quantitative survey that included a reliable comparison group of non-beneficiaries. As discussed, the results show significant increases in crop productivity, diversification of farm enterprises, employment, income levels, and other indicators of an enhanced standard of living.[26] The farmers contended that it was not only the *inputs* that increased their output but the *knowledge* of which combinations of inputs to use, at what time, and in what manner.[27] The ICR joint mission included consultations with a range of stakeholders (about 500), covering farmers/beneficiaries, local government officials/agency representatives, and local service providers, spread over 14 districts and 16 beneficiary cooperatives. Focus group discussions were conducted to determine whether participants would validate the findings from the OPM beneficiary assessment. The responses confirmed and deepened the findings from the OPM assessment study.[28]

4: Assessment of Risk to Development Outcome - Rating: Moderate

85. The PAD for RSSP 2 provided a comprehensive risk assessment to development outcomes and the sustainability of project achievements in terms of country/sectoral factors and RSSP 2-specific risks. Project-specific risks consisted of inter-related technical and design issues, implementation and institutional issues, financial management and accountability of the

[26] To cite a few telling examples: 12 percent of project beneficiaries use electricity compared to 2.8 percent in the comparator group; 74 percent of project beneficiaries have savings accounts compared to 34 percent in the comparator group; 79 percent of beneficiaries have paid up their health insurance premiums against 69 percent of the comparator group; and 48 percent of beneficiaries own livestock compared to 35 percent for the comparator group.

[27] See Annex 6 for summary findings taken from the OPM impact study and for details on the framework that guided the discussions and a summary of the feedback from focus group discussions (sections b and c) from the ICR field visit, including valuable insights on lessons learned under RSSP 2.

[28] Annex 6.

PSCU, procurement, and social and environmental impacts. In retrospect, however, the PAD could have explicitly assessed three important risks related to important stakeholders that are integral to sustaining project benefits. The first risk is related to individual beneficiaries' and households' capacity to continue activities supported by the project in a sustainable and organized manner. The second risk is related to cooperatives' and WUAs' commitment to the continued strengthening and accountability of marshland schemes. The third is related to government's explicit commitment at the central and district levels to continue providing effective services to cooperatives.

86. The risk to development outcome is evaluated as ***moderate***, for several reasons. Agriculture is primarily a private enterprise, so individual beneficiaries and their households need to continue to invest in their land, to build upon the project experiences, and to willingly continue to operate in cooperatives or other farmer organizations that allow them to gain economies of scale in accessing inputs and markets. Agriculture also remains a relatively complex and risky sector, subject to many exogenous shocks, such as climate change and extreme weather events, input and produce price shocks, and market and policy failures (including tariff and non-tariff barriers).

87. The government has consistently exhibited strong ownership at the central and local levels throughout implementation. It is ensuring a sound macro and sectoral policy environment, and it has enhanced support services to adopt demand- and market-driven approaches. The government and MINAGRI continue to pursue the decentralization strategy and to support agricultural services through institutional reforms, especially of RAB. MINAGRI is also proceeding to strengthen coordination among development partners through complementary programs and consistent, harmonized approaches to marshland rehabilitation and hillside development. Additional evidence is the strong content and implementation of PSTA 2, followed by the emerging sound formulation of EDPRS 2 and PSTA 3, which give greater attention to private sector development strategies and partnerships in the rural sector.

88. The project provided intensive capacity development for the cooperatives and newly established WUAs. These community-based mechanisms have focused on developing good governance structures, accountability mechanisms, and relevant and practical business skills and practices. The officers and members of WUAs are aware of the need to charge realistic fees to maintain the schemes. At the national, district, and sectoral levels, there is a zero tolerance policy on corruption.[29] The project has trained internal auditors for each cooperative, and members demand transparency and performance. Because WUAs are a relatively novel institution, there is some "moderate" risk that some WUAs may not operate effectively and/or that Government may not provide the support or strengthening they require, especially in the early stages.

5. Assessment of Bank and Government of Rwanda Performance

5.1 Bank Performance

(a) Bank Performance in Ensuring Quality at Entry - *Rating: Satisfactory*

[29] Rwanda ranks 50 in Transparency International's Corruption Perception Index for 2012—a significant improvement from its ranking in 2007 (111).

89. The Bank's performance in quality at entry of RSSP 2 was ***satisfactory.*** The Bank worked closely with GoR to design a sound project. A timely PHRD grant funded strategic studies to underpin the project's design, building on well-identified lessons from RSSP 1. The project design was aligned with EDPRS, PSTA 1 and 2 (and now 3), and the Bank's CAS. The Bank team had a good mix of skills. The team was experienced, largely field-based, and did not change during design and implementation. The Bank provided valuable input for defining the PDO, supported by a sound results framework with "SMART" performance indicators.[30] The project strategically focused on two major, complementary components. It used an innovative approach to design marshland irrigation schemes and develop capacity in cooperatives. RSSP's strict compliance with economic criteria for each scheme helped to ensure that they were economically viable. The government expressed a preference for the Bank to finance the schemes because it wanted the Bank to utilize and continue to strengthen GoR's procurement capacities. Other donor and ministry funds financed operations in the smaller marshland and hillside areas.

(b) Quality of Supervision - *Rating: Highly Satisfactory*

90. The Bank's performance in supporting implementation was ***highly satisfactory.*** The task team was primarily field-based. It was technically strong, experienced, and received constructive management support (in-country and from headquarters). The team's timely, effective, and responsive advice was instrumental for resolving issues that arose during implementation, such as the financing gap. Additional examples of its support include: regular, comprehensive "implementation support missions" that had a skills mix that was highly valued by GoR, as evidenced by Government's timely implementation of mission recommendations; timely resolution of complex contractor issues, without compromising the project's and Bank's fiduciary requirements; helping SPIU/MINAGRI build capacity to comply with multiple safeguard requirements; and helping to achieve a functional M&E system. Such contributions enabled the Bank task team to establish strong, trustworthy, and effective working relationships with the central and district government and other key stakeholders. Those relationships helped the team to maintain a consistent focus on achieving/exceeding the project's development outcomes and triggers for RSSP 3. The team was also proactive in encouraging GoR to prepare and implement a sound sustainability strategy.

(c) Justification of Rating for Overall Bank Performance - *Rating: Satisfactory*

91. The Bank's performance was adequate to the tasks and facilitated the success of the project.

5.2 Borrower Performance

(a) Government Performance - *Rating: Highly Satisfactory*

92. Government (central and local levels) merits a ***highly satisfactory*** rating because it consistently demonstrated a high level of commitment to and ownership of the RSSP program and Phase 2 design and implementation, as reflected by: strong alignment of RSSP 2 to EDPRS and PSTA 2 objectives and performance indicators; proactive engagement of MINAGRI's

[30] As previously mentioned, the "marketing objective" and cooperative performance indicators could have been underpinned by more sharply defined performance measures to determine the extent to which these two key aspects were met.

Minister, Permanent Secretary, and district authorities throughout the design and implementation phases; proactive engagement of the Honorable President, as revealed by his repeated field visits and the support he expressed for the project and of beneficiaries' participation; the doubling of GoR counterpart funds (to fully meet resettlement costs); a proactive, effective PAC, which met regularly, was consistently chaired by MINAGRI's Permanent Secretary, was attended by high-level officials from key ministries/agencies, provided strategic guidance to PSCU, and helped resolve issues outside the direct control of the PSCU team; and the Government's formulation and approval of important policies initiated by the project, which created a conducive policy environment for the project's success, including: (i) the rice marketing policy; (ii) the WUA legal framework; (iii) changes in PSCU staff incentives and salary structure to stem the high staff turnover that would have threatened the project's success; (iv) the implementation and full funding of a resettlement action plan for marshland schemes; and (v) the initiative that resulted in the creation of SPIU, with its consequent efficiencies.

(b) Implementing Agency Performance (PSCU/SPIU) - *Rating: Highly Satisfactory*

93. The PSCU/SPIU had demonstrated exceptional performance. The Project Coordinator and all project staff were highly committed to the project's successful, quality, sustainable, and timely implementation, as demonstrated by the SPIU's timely, sound resolution of implementation issues, which enabled project objectives and targets to be met one year ahead of the formal closing date.[31] This commitment was backed by a sound mix and number of skills and a strong outcome orientation, as reflected in how the project team focused on and managed the RSSP 2 results framework and related performance measures (using the M&E system as an effective tool). The SPIU demonstrated timely, quality compliance with all project agreements and mission action plans. Fiduciary arrangements and processes were highly effective, including implementation of the procurement plan and performance in preparing consistently unqualified project audit reports. The SPIU maintained productive partnerships with the PAC (which became the inter-ministerial steering committee), beneficiary cooperatives, district officials, and other implementation partners and stakeholders. All of these actors worked well to facilitate the achievement of the project's strategic objectives and the triggers for Phase 3. The timely initiative to formulate and implement the sustainability strategy was also a valuable contribution. Finally, in hosting numerous delegations from developing countries,[32] the SPIU played a key role in scaling up successful design and implementation, not only nationally but with other African countries, and demonstrating a desire to be innovative and to document results.

(c) Justification of Rating for Overall Borrower Performance - *Rating: Highly Satisfactory*

94. The Borrower's performance was highly adequate in the design and implementation phase in delivering on the RSSP series/program objectives and the PDOs/indicators for RSSP 2, exceeding standard practices. As noted, the project met its objectives and performance indicators 12 months ahead of schedule. The transition to RSSP 3 was seamless and includes a sound sustainability strategy.

6. Lessons Learned

[31] See paragraph 26 on physical infrastructure achievements.

[32] Four teams visited: two from Uganda; one from Burundi, and one from Kenya. Under RSSP 3, other country delegations continue to visit, reflecting positively on the RSSP 2 experience/results.

95. RSSP 2 generated valuable lessons applicable to RSSP 3 and other agricultural projects in Rwanda and beyond. Seven key lessons flow from the RSSP 2 experience.

96. **The strong, demonstrated commitment of Government at various levels, and effective mechanisms to sustain that commitment, are vital for success and essential to embark on a scaling up phase.** Government and the sector had a clear strategic vision and objectives: *Improve national food security and reduce dependence on imports of basic food crops in an efficient manner*. Those strategic aims, enshrined in the PSTA series and the national medium- and long-term vision, drove the emphasis on intensification and irrigation under RSSP 2 and were instrumental for the project's achievements. Throughout RSSP 2, Government provided strategic guidance and enacted laws that continue to sustain advances under RSSP 2. Effective mechanisms to sustain commitment to the project included the establishment and strengthening of the PAC; alignment with national, decentralization, district, and sectoral policies, strategies and performance indicators; and the sound formulation and use of a medium-term expenditure framework and M&E system to ensure achievement of key performance targets.

97. **Close implementation support by the Bank and sector was invaluable for resolving implementation challenges**. A full-time Bank international staff member in the field and full-time local staff dedicated to supporting implementation gave the client continuous access to the Bank, and issues were resolved rapidly and responsively. Special support missions were arranged when required (for example, for engineers to handle contract delays). Implementation support missions for RSSP 2 were held every six months with a full complement of skills on both teams, which allowed close attention to detail and better delivery of results. Also, proactive leadership on resettlement by MINAGRI was the key to smooth implementation and a high level of satisfaction among those affected by resettlement. The resettlement model developed in RSSP 2 has been adopted by other projects, programs, and development partners in the agricultural sector. Under RSSP 2, GoR financed all resettlement costs. It insisted on building the capacity to implement resettlement within the PIU and requested Bank support for doing so. The Bank provided extensive training, close implementation support, and supervision during the process.

98. **The marshland investment model developed in RSSP offers a basic framework for replication throughout Rwanda.** The model has been the basis for new policies and institutions throughout the sector. Before Rwanda initiated the RSSP program, there was little to no irrigation in the country. The model developed under RSSP has become the basis for similar work by other development partners (IFAD, AfDB) and is laying the foundation for national irrigation roll-out and further agricultural intensification.

99. **Approaches that enhance farmers' business skills, promote value chains, and link farmers to financial institutions provide inclusive, sustainable benefits.** It is vital to strengthen farmers' business skills and knowledge through relevant and practical approaches, such as participatory and market-responsive value chain approaches, farmer-based extension, and training for large numbers of lead farmers. Additionally, linking farmer groups and cooperatives to savings and financial institutions, together with supporting mechanisms such as risk reduction, can ensure the sustainability of project investments. By introducing farmers to local banking as a

way to enhance their productivity and farm marketing strategies, the project initiated a mutually beneficial relationship between farmers and the banking system.

100. **RSSP 2 demonstrates the wisdom of continuity in the financing mechanism and implementation teams.** A programmatic approach (financing mechanism) is advantageous to consolidate, scale up, and sustain project benefits from a previous phase, while ensuring clear criteria and initiatives for new interventions. GoR and the Bank are working closely to maximize the full benefits of the APL instrument (as seen with the early financing of technical design studies within and between phases, and the sustainability strategy for RSSP 2). These efforts are significantly amplified by maintaining stability in the counterpart implementation team. The Minister and Permanent Secretary were involved in the sector from RSSP 1. The SPIU had turnover of less than 10 percent during RSSP 2, and 90 percent of the Bank implementation support team was maintained through implementation.

101. **WUAs should be established and strengthened at the start of irrigation works**. As mentioned previously (paragraph 42), this approach instills ownership and understanding of the irrigation schemes—of how they function and of the roles and responsibilities of all water users. The approach also reinforces the need to operate and maintain the infrastructure (a public good) properly and to separate that responsibility from the cooperative, which essentially engages in private productive and entrepreneurial activities.

102. **Strengthen hillside cooperatives associated with marshland rehabilitation and development.** Instead of working with multiple hillside cooperatives spread throughout the country, RSSP 3 is adopting a more targeted and approach of establishing and strengthening cooperatives on the hillsides that surround RSSP 3 marshlands. In addition, RSSP 3 is strengthening a few of the weaker and later entry cooperatives inherited from RSSP 2.

7. Comments on Issues Raised by the Government of Rwanda, SPIU, and Partners

(a) Borrower/Implementing Agency

103. Annex 7 provides a transcription of the letter from the Minister of MINAGRI stating agreement with the findings and ratings of the ICR and expressing appreciation for the support rendered to MINAGRI and the Rwandan people through the project. The letter states that RSSP 2 had a significant impact on farmers' lives, which can be witnessed by visiting them and hearing their stories. RSSP 2 laid the foundation for RSSP 3, which will lead to more poverty reduction and higher incomes. Annex 7 also summarizes Government's ICR of November 2012.

(b) Cofinanciers

104. Not applicable.

(c) Other Partners and stakeholders

105. Wide distribution of the ICR is planned within the donor community in Rwanda to share lessons learned and strengthen further collaboration in the sector.

Annex 1: Project Costs and Financing

Table 1: PAD vs. Actual RSSP 2 Costs (US$)

Component	PAD Estimate	Actual Costs	Actual as % of PAD
1) Marshlands and Hillsides Rehabilitation and Development	26,513,000	27,122,456	102
a) Marshlands Schemes	22,249,200	22,169,431	99.6
b) Hillsides Development	2,963,800	4,194,076	142
c) Environment and Social Safeguard Contingencies	1,300,000	758,949	58
2) Strengthening Commodity Chains	5,536,000	5,329,161	96
a) Strengthening Farmer Organizations and Cooperatives	3,129,000	3,083,587	98
b) Improving Production Technologies	890,000	840,280	94
c) Rural Investments for Economic Infrastructure	1,000,000	1,188,949	118
d) Knowledge Generation and Dissemination	517,000	216,345	42
3) Project Management/Support and Coordination	6,283,900	6,603,072	105
Project Preparation Fund	584,200	233,082	40
Total Baseline Cost	38,917,100		NA
Physical Contingencies	64,100		NA
Price Contingencies	10,300		NA
Total Project Costs	**38,991,500**	**39,287,771**	**100.5**

Table 2: RSSP 2 Financing

Source of Funds	Appraisal Estimate (US$ millions)	Actual Estimate (US$ millions)	Percentage of Appraisal
Borrower	2.0	4.5	225%
IDA	35.0	32.8	94%
Beneficiaries	1.99	2.0	100%
Total Financing	**38.99**	**39.3**	**100.8%**

Annex 2: Main Outputs by Component and Emerging Evidence of Outcomes and Impact

Component 1: Marshlands and Hillsides Rehabilitation and Development

1. This component consists of two subcomponents, marshlands rehabilitation and development and sustainable development of hillsides. This component's objective was to expand irrigated area in cultivated marshlands and increase sustainable land management on nearby hillsides to accelerate agricultural intensification.

Subcomponent 1.1: Marshlands rehabilitation and development (US$ 22.2 million planned vs. US$ 22.2 million actual)

2. Most of the project's activities were organized around this subcomponent, which focused on rehabilitating and developing gravity irrigation schemes in selected marshlands to ensure additional reliable irrigation on 3,300 ha. The project covered costs associated with developing infrastructure, mobilizing stakeholders and strengthening their capacity, establishing WUAs, conducting participatory M&E to build farmers' capacity to monitor and improve the performance of irrigation schemes, and establishing a national association of irrigation professionals. The two outcome indicators associated with this subcomponent were: (i) at least 3,300 additional ha of irrigated marshlands developed or rehabilitated; and (ii) at least 75 percent of farmers in irrigated marshlands rehabilitated or developed by the project pay water charges through WUAs.

3. Both indicators were surpassed. The project developed 2,769 new ha of irrigated marshland and rehabilitated another 555 ha for a total of 3,324 ha, all of which is used to produce rice. The associated infrastructure (dams) is used for other economic activities such as fish farming. Ninety five percent of farmers in the irrigated marshlands pay for water through WUAs compared to the target of seventy-five percent that was set at appraisal. Three other significant outputs are ascribed to this subcomponent. First, MINAGRI engineers have improved their capacity to rehabilitate and develop marshlands. Second, a national legal framework was developed for WUAs. Finally, the construction of irrigation infrastructure created temporary employment for laborers (more than US$ 10 million went to labor costs).

Subcomponent 1.2: Sustainable development of hillsides (US$ 2.96 million planned vs. US$ 4,194.1 million actual)

4. This subcomponent provided resources to improve the productivity of farming systems on hillsides adjacent to the marshlands where irrigation schemes were developed. Among other activities, the project financed the promotion of cost-effective soil and water conservation technologies and sustainable cropping practices for hillsides. The outcome indicator for this subcomponent was that at least 9,900 additional ha of hillsides would be sustainably developed.

5. The project implemented cost-effective soil and water conservation technologies (including mechanical and vegetative measures) on 10,096 ha compared to the target of 9,900 ha. Farmers planted more than 11 million agroforestry trees (with an estimated survival rate

exceeding 70 percent) and adopted sustainable hillside intensification technologies, especially those related to soil fertility management and IPM. These investments contributed substantially to increasing yields of basic food crops (for example, maize yields rose by 337 percent and bean yields by 87 percent). The soil and water conservation techniques have helped to control soil erosion, while the new trees will provide a range of benefits, including livestock fodder and environmental services.

Component 2: Strengthening Commodity Chains (US$ 5.6 million planned vs. US$ 5.3 million actual)

6. This component had 4 subcomponents, strengthening farmer organizations and cooperatives, improving production technologies, rural investments for economic infrastructure and knowledge generation and dissemination. The overall objective of Component 2 is to strengthen commodity chains by supporting the commercialization of smallholder agriculture in targeted marshlands and hillsides. The component focused on achieving this goal by promoting value addition and by building capacity in cooperatives, particularly business skills. The indicators reflect this orientation: development of business plans, marketing of certified seed, and provision of rural infrastructure to the satisfaction of users.

Subcomponent 2.1: Strengthening farmer organizations and cooperatives (US$ 3.2 million planned vs. US$ 3.1 million actual)

7. This subcomponent covered: (i) strengthening farmer organizations and cooperatives to improve their governance mechanisms and instill sound business practices; (ii) supporting capacity-building activities; (iii) providing training, technical assistance, and advisory services to build basic operating capacity in all farmer organizations and cooperatives with which it engages; and (iv) providing training, technical assistance, and advisory services to improve business planning and management capacity in a selected number of more commercially oriented cooperatives. The performance indictor for this subcomponent is the number of cooperatives supported by the project that have quality business plans under implementation.

8. Local service providers assisted 81 of 83 cooperatives supported by the project to develop business plans. A study of 17 randomly selected business plans by the impact assessment team found that the average rating was very good, although market analysis was a common weakness of the plans. The study also found that in some cases the cooperative members receiving the business plan training still considered it very complex and difficult, and suggested that further follow-up would be required.

9. Many RSSP 2 cooperatives put their business plans into action. A majority of these cooperatives recognized that post-harvest handling and marketing were as important as production and generally invested in storage facilities or equipment to add value, such as milling equipment. All rice cooperatives bought paddy threshers because of their importance in ensuring good quality and time savings. Maize cooperatives invested in shellers. All of these technologies reduce labor and were affordable to farmers.

Subcomponent 2.2: Improving production technologies (US$ 0.89 million planned vs. US$ 0.840 million actual)

10. To improve production and productivity of farming systems in marshlands and hillsides, the project provided support to: (i) train producers; (ii) provide technical advisory services; (iii) establish demonstration plots to disseminate best practices for sustainable soil and water management; (iv) catalyze the increased use of improved inputs (seed and fertilizer) through innovative arrangements; and (v) encourage the adoption of IPM practices.

11. Information compiled by the SPIU M&E team indicates that members of beneficiary cooperatives increased production between 2008 and 2011. The increases clearly seem to derive from the project's two components, including enhanced production infrastructure, training in improved farming methods, and improved cooperative organization and marketing. Information recorded by numerous cooperatives charts progress in expanding the share of marketed produce and increased earnings. The conclusion is that these trends reflect higher incomes among the farmers who belong to the cooperatives assisted through the project.

Marketed share

12. "Marketed share" is the share of production collected by cooperatives from members and sold in the market. All project cooperatives, on average, market over 70 percent of their production—a share that has increased steadily since 2008. This increase is significant, because prior to RSSP 2, the large majority of farmers did not sell their produce through their cooperatives. The cooperative collection system has been a key factor in strengthening the cooperatives. Several aspects are worth noting:

- ***Access to inputs.*** Cooperatives are able to buy all the necessary fertilizer and seed, knowing that farmers will be able to repay the cost of the inputs at the end of the crop season. The cooperatives deduct the money owed for inputs from the payments made to farmers after produce is sold. This practice enables farmers to get sufficient fertilizer on time (86 percent of RSSP 2 beneficiary farmers use fertilizer, compared to the national average of 32 percent).
- ***Operating costs.*** Cooperatives also use the collection system to cover their operating costs (including staff salaries and costs of transporting produce). The cooperatives retain an amount that can be as high as RWF 25 per kilogram sold. The amount is decided by the General Assembly of each cooperative.
- ***Access to financial services.*** The collection system expanded farmers' access to the financial sector. Farmers are required to open bank accounts to receive payments from the cooperatives. This practice has positively influenced the savings culture among farmers. According to the OPM impact assessment (2012), more than 80 percent of beneficiary farmers possess a savings account (versus a negligible number prior to the project). The project also greatly expanded access to credit for many farmers (for example, 48 percent of beneficiary farmers could finance the purchase of cows).

Subcomponent 2.3: Rural investments for economic infrastructure (US$1.0 million planned vs. US$ 1.2 million actual)

13. The main goal of this subcomponent was to support productive rural investments by community-based organizations and occasionally by districts. Activities under this subcomponent were funded through Local Development Funds (LDFs). In response to the demands and priorities from the community, LDFs provided funding to farmer organizations, cooperatives, NGOs, and occasionally districts for strategic investments in public goods and services (for example, community grain drying and storage facilities, rural roads) specifically linked to other key project areas. The performance indicator for this subcomponent measures the percentage of rural infrastructure projects that were funded through the LDFs and with which the majority of users were satisfied one year after the project's completion.

14. RSSP 2 provided 30 drying bays for rice production marshlands, 5 storage centers for rice, 8 storage centers for other commodities, and 2 collection centers for vegetables. The user satisfaction survey revealed that more than 63 percent of users were very satisfied with the facilities provided and more than 98 percent were either very or quite satisfied. Although RSSP 2 delivered the economic infrastructure planned under the project, the demand for post-harvest infrastructure, including drying bays and storage centers for rice, remained high in the project area, and few alternatives existed to meet that demand. Options for raising additional resources for post-harvest infrastructure were considered, such as: (i) modifying the design to reduce overall construction costs; (ii) increasing the counterpart contribution; and (iii) helping cooperatives access credit to fund construction costs, for example through the Second Rural Investment Facility (RIF 2), which is ideally suited for that purpose. The project strategy is to encourage cooperatives to expand rural infrastructure through loans, because the project had helped to increase access to finance.

15. The project was designed to provide technical support for additional infrastructure complementing the project investment and funded by MINAGRI. Such infrastructure included the construction of storage facilities and rice mills. MINAGRI invested in three rice mills, one seed plant, and two silo plants, which proved critical for ensuring rice farmers' access to markets. Without the MINAGRI investment, farmers would not have benefited from higher rice prices and an assured market.

Subcomponent 2.4: Knowledge generation and dissemination (US$ 0.517 million planned vs. US$ 0.216 million actual)

16. This subcomponent supported diagnostic studies, market surveys, and problem-focused applied research to generate and disseminate science-based knowledge and information that would inform decisions on key project issues. Results of a diagnostic study, although somewhat delayed, enabled cooperatives to identify training needs and priorities for the project. A market survey that generated empirical knowledge on the performance of Rwanda's rice commodity chain was used to design more efficient, profitable rice marketing approaches for all actors along the commodity chain. For example, one key recommendation was to improve milling to improve rice quality at a low cost. In response, the Government of Rwanda developed and adopted a new Rwandan Rice Policy to regulate rice milling. To achieve the government's objective of

producing quality domestic milled rice capable of competing with imported rice, the policy encourages the use of modern mills and prohibits small rice hullers and mills that produce more than 15 percent broken rice or have no capacity for grading. Modern rice mills have been installed in 11 areas, and 7 more mills are planned.

Safeguards

17. Compliance with environmental safeguards was rated satisfactory throughout the life of RSSP 2. The rating for social safeguards was also satisfactory throughout the project, with two exceptions. The regular Bank implementation support missions closely monitored the environmental and social aspects of the project. The project benefitted from the strong and committed team members, who worked closely with the project-affected people to achieve full compliance with the national and World Bank requirements for environmental and social due diligence.

18. Compliance with social safeguards experienced some initial challenges. Social safeguards were relatively new for RSSP; PSCU responsibilities for project resettlement activities were assigned late; and there was high turnover among district authorities. These factors resulted only in minor delays, however, because the PSCU team demonstrated strong capacity to manage the situation well and ensure timely decisions in consultation with district authorities. The main concern was to resettle and compensate people affected by the rehabilitation of marshlands; by the MTR (October 2010), resettlement had proceeded smoothly.

19. Although the project had no significant environmental concerns, it ultimately improved comprehensive watershed management in the target areas. Subproject-specific studies indicate that RSSP 2 helped to minimize erosion on hills and sedimentation; increase plantings of native tree species to control erosion in catchment areas; and apply IPM practices in the target marshlands. At one of the project sites, Muvumba VIII, the project restored and protected a degraded gallery forest (216 ha) using the native endangered tree species Acacia kirkii.

20. At preparation, the project correctly identified the environmental and social safeguard policies that RSSP 2 would trigger, based on the lessons learned in RSSP 1: OP/BP 4.01 (Environmental Assessment), OP 4.04 (Natural Habitats), OP/BP 4.09 (Pest Management), and OP 4.12 (Involuntary Resettlement). OP 7.50 (Projects in International Waterways) was also triggered, so the Bank, at the request of the Government of Rwanda, prepared and sent riparian notifications to the countries in the Nile and Lake Tanganyika Basins on May 5, 2008.

21. The project prepared an Environmental and Social Management Framework (ESMF), because the project sites were not known at preparation. The ESMF contained an environmental and social screening tool for investments that was integrated into the review of the funding requests emanating from communities, District Government officials, and other project beneficiaries. The ESMF covered potential impacts on Natural Habitats, which was also reflected in the subproject-specific assessments. As part of the subproject selection, the RSSP 2 team prepared a comprehensive Environmental and Social Impact Assessment (ESIA) for 13 potential target marshlands in January 2008. Individual ESIAs were prepared for Muvumba V and VIII Marshlands. The Bank reviewed those assessments and found them to be satisfactory and of high

quality. The ESMF and these two ESIAs were disclosed in country and on the World Bank InfoShop.

22. To mitigate the potential environmental impact of increased pesticide use, and in compliance with the triggered pest management policy, the RSSP 2 team prepared a Pest Management Plan (PMP), disclosed in January 2008. The PMP focused on IPM practices for the target crops (maize, rice, potatoes, cassava, and tomatoes).

23. RSSP 2 complied with the Bank's riparian guidelines, which involved informing and getting concurrence (on a no objection basis) from six affected countries, confirming that water diverted from several rivers did not cause adverse effects to those countries). The notifications were sent on May 5, 2008 and no unfavorable response was received from any of the notified riparian states, which was reflected in project documentation on June 6, 2008.

24. A Resettlement Policy Framework (RPF), prepared by the RSSP 2 team and disclosed in January 2008, established guidelines for preparing Resettlement Action Plans (RAPs) for any subproject that involved resettlement or loss of access to resources for project-affected people. The ICR mission recognizes the challenges in implementing resettlement activities and commends the project for surpassing the OP 4.12 requirements. Despite Rwanda's very high population density, the districts provided land for land to farmers who needed to be resettled from government-owned marshlands. The project team remained closely involved with beneficiaries throughout implementation, not only ensuring timely compensation but helping to open bank accounts for project-affected people, providing training in crop intensification, and (most important) setting up and utilizing a successful grievance redress mechanism. Farmers direct grievances to the project's District staff, who notify safeguards staff in the SPIU. Safeguards specialists then address the grievances at the site, working with the farmers to resolve any issues.

25. The project prepared and implemented 13 RAPs: Nyarubogo dam, Nyarubogo irrigation channel, Ntende-Rwagitima irrigation channel, Ntende dam, Kiliba dam, Rugeramigozi dam, Kinyegenyege marshland, Gisaya, Kibaya, Kinnyogo, Muvumba V, Muvumba VIII dam, and Muvumba VIII channels. Prior to project completion, the team developed a Resettlement Completion Report that the Bank team found to be of good quality. The RAPs and the Completion Report were diligently disclosed on the RSSP website and in the World Bank InfoShop.

Procurement

26. Given the importance of procurement for achieving project objectives, this section highlights an assessment of the project's procurement implementation performance. Prior to project start-up, the PSCU procurement team had prepared a procurement plan and procurement manual (including a manual for the community-based works), which the Bank deemed satisfactory. This achievement reflected the continuity and cumulative experience gained during RSSP 1, which had not developed these important procurement implementation tools sufficiently early and had experienced significant procurement problems. During RSSP 2, the PSCU awarded 100 contracts, which were executed in accordance with agreed procurement methods and a generally sound procurement plan prepared prior to launching the project (and updated

periodically as needed). They included 27 works contracts, 18 goods contracts, and 55 consultancy contracts. No instances of misprocurement occurred. Some of the technical studies and contracts had been carried out during the latter phases of RSSP 1, which enabled RSSP 2 to implement those contracts during the initial RSSP 2 period and contributed to early completion of works.

27. The project's overall positive performance for procurement reflects positive factors, various obstacles, and lessons. Various procurement risks were well identified at appraisal, together with appropriate mitigation measures, including: sound procurement arrangements by a procurement unit in the PSCU; posting of procurement staff in central, provincial, and district offices; and provisions for procurement training at various levels and times.

28. *Positive factors and obstacles*. Implementation benefited from adequate procurement staff levels and suitable procurement training. The central procurement team was quite experienced with World Bank and national procurement procedures, because they had handled procurement under RSSP 1 (another benefit of continuity through an APL). Procurement staff improved their procurement planning tools by periodically updating procurement plans (an improvement over the RSSP 1 experience), using PROCYS when it was introduced in 2008, and coaching other project procurement staff to use this tool. In contrast, at the district level, procurement capacity was generally limited, and the procurement staff was not familiar with national and World Bank procedures. Accordingly, the PSCU procurement team (from headquarters and the provinces)33 carried out initial orientation sessions as well as periodic procurement workshops to provide district project procurement staff and cooperative members (from the newly established procurement committee) with the tools to conduct transparent, sound procurement.

29. A review of contracts in the project procurement plan showed two bid and two contract execution delays during implementation. Contract execution under RSSP 2 was assessed for the ICR exercise. Delays were occasioned mainly by the following factors, primarily in the marshland schemes:

- A few technical designs required adjustment during implementation. They were adjusted expeditiously, with Bank concurrence where needed.
- Local contractors had low technical and financial capacity and insufficient and inappropriate equipment, especially for dam and radical terracing works for hillside development.
- Replacement personnel were not always as qualified as those included in the original bids submitted by contractors.
- Some contracts were too big for local firms, given their capacity, but too small to attract international firms.
- Procurement staff had very limited involvement in managing contracts, especially in monitoring compliance with provisions in procurement contracts. These issues received

[33] The initial project plan (as reflected in the PAD) was to recruit a procurement assistant for each of the four provinces, totaling four staff. However, to reduce costs the Project Management decided to recruit only two for the four provinces because this number and working arrangements were considered to be adequate, to which the Bank agreed. While the work load was high for these two provincial procurement staff, they received adequate support from central level, and were able to handle the work load efficiently in support of achieving the project's objectives/targets.

increased attention as the implementation of RSSP 2 progressed. By the project's last year, the procurement team was conducting field visits to monitor contracts and had helped to improve management decision-making. Coordination with the M&E system, which included a contract monitoring system, had also improved.[34] These improvements have continued under RSSP 3.

30. *Lessons*. Smooth and efficient procurement was vital to the success of RSSP 2. Several of the more important lessons specific to procurement under RSSP 2 can help to ensure that RSSP 3 benefits from experience in the project's previous phase:

- From the early stages of preparation, share with the implementing agency appropriate World Bank tools to expedite sound standard bidding documents. PROCYS, Client Connection, and other relevant procurement planning and implementation tools can all speed procurement, facilitate implementation, and improve the likelihood of meeting key performance targets.
- Recruiting adequate procurement staff at the provincial level helps to build capacity at the district level in addition to expediting procurement.
- Establish a contract management monitoring system that will closely monitor contract execution. Involve procurement staff in contract management to help reduce delays and ensure that the provisions of contracts are consistently respected.

Ensure adequate and timely training in national procurement procedures for the procurement committees established by cooperatives. This step will reinforce their capacity and reduce errors in procurement processing. Trained procurement committees also enhance transparency and accountability in the procurement process.

Progress toward Overall RSSP Program Indicators

31. The overall program indicators are intended to measure the progress against the overall RSSP program objective, which is to increase total incomes and reduce poverty by raising productivity and expanding employment of land and labor in rural areas. These indicators are applicable for all three phases of RSSP. In Phase 1 the indicators were not defined precisely and were not tracked. A baseline was determined at the end of Phase 1, based on the Impact Assessment survey undertaken at that point (2008). During RSSP 2, the three key indicators were also defined more precisely. Table 3.2 highlights the impressive progress made by RSSP 2 by the end of 2011.

32. It is noted that it is apparent that the preparation team for RSSP 1 and the overall 3 phase RSSP APL did not take into account the need to establish a baseline for the Program indicators establishing with-project /without-project comparisons to be able to evaluate program results. Not having this information systematically is a problem, especially when seeking to attribute poverty reduction and other broader welfare changes enabled by direct, project-induced benefits. Similarly, it is a reflection on the M&E design that apparently the most comprehensive measure of household income was chosen as an indicator for the overall program goal. The fact that

[34] For example, during RSSP 2 implementation, the Project hired an additional M&E Assistant for contact monitoring purposes who worked closely with the Procurement team on routine basis. This arrangement became very important after the LWH and RSSP merger and creation of a larger portfolio to be tracked by the Procurement team.

household income/expenditure have other powerful drivers beyond farming suggests that this choice was not entirely appropriate.

Table 3.2: Summary of Progress of Overall Program Indicators

Overall Programme Indicators	Baseline	Sources	Indicator Value	Target Reached
1. Change in the average level of household incomes among Programme direct beneficiary households	48,840 RwF	Primary source: EICV3	232,000 RwF	No target
2. Change in the percentage of Programme direct beneficiary households under the poverty line	65.66%	Primary source: EICV3	39.3%	No target
3. Change in the average level of rice yields per hectare in districts having marshlands rehabilitated or developed by the Programme	2.7 t/ha	Primary source: Crop Assessment surveys Validation: RSSP data, focus group discussions	5.34 t/ha in season A 5.84 t/ha in season B	No target, 97% increase in season A

33. The baseline for ***Indicator 1*** comes from the impact assessment at the end of RSSP 1 and measures income from sales in beneficiary households. Based on the documentation, however, the clear intent is that this indicator should refer to a more comprehensive measure of household income, and it is therefore updated using EICV3 data.[35] The OPM evaluation team decided to use the estimate of consumption expenditure from the EICV3, rather than the estimate for income. It is widely accepted that income and expenditure are strongly correlated, and there are strong theoretical reasons for preferring expenditure. Consumption data are generally accepted as smoother and less subject to fluctuation than income data; and consumption is in general considered more reliable and easier to measure than the equivalent income figures.[36] The figure used, RWF 232,000, is the mean annual consumption expenditure per adult equivalent.

34. Because there is limited comparability between the baseline and the current estimate for Indicator 1, it is difficult to say anything more than that the figure has clearly increased. Both figures are calculated in prices of the respective year and have not been deflated. It is, however, possible to compare the figure for RSSP beneficiaries in the EICV3 sample with a comparator figure from the same EICV3 dataset. The comparator figure—for all rural households outside Kigali (not benefiting from RSSP 2), in which at least one household member has a main job on the family farm—is RWF 214,964. So we can say that RSSP 2 beneficiaries have experienced improvements in their absolute consumption figures and have higher consumption levels than their peers in Rwanda. However, given the lack of comparability between income and consumption, it was agreed that the evaluation RSSP 3 for the Program level indicator 1 would measure both income and consumption.

[35] Note that the EICV3 data do not allow differentiating between households that are currently benefiting from RSSP support and those that previously did but no longer do. The estimates on consumption expenditure and poverty levels presented in this report are therefore based on all households that *ever* benefited from RSSP support.

[36] A. Deaton (2002), "Guidelines for Constructing Consumption Aggregates for Welfare Analysis." LSMS Working Paper No. 135, World Bank, Washington, DC.

35. The baseline for ***Indicator 2*** is also taken from the RSSP 1 impact assessment. The equivalent figure for 2010/11 from EICV3 data is 39.3 percent,[37] a significant reduction in the proportion of beneficiary households below the poverty line. The equivalent figure for the comparator group within the EICV3 data (that is, non-beneficiary rural farming households) is 45.3 percent, so again we can say that RSSP 2 beneficiaries are better off.[38] As we lack an equivalent comparator figure for the baseline, however, we cannot technically say that RSSP 2 beneficiaries have benefited from a reduction in poverty at a faster rate than the comparator group, although it seems likely that to be the case.

36. ***Indicator 3*** is measured from MINAGRI crop assessment surveys. The districts in which RSSP 2 had rehabilitated or developed marshlands were identified, and the average crop yield was calculated by simply dividing total production in those districts by area. The average rice yield is 5.34 t per hectare compared to 5.2 t per hectare for Rwanda as a whole in season A and 5.84 t per hectare for season B, as opposed to 5.75 t per hectare for Rwanda as a whole.[39]

[37] National statistics usually report poverty at the individual level—that is, the proportion of individuals under the poverty line—rather than proportion of households, as indicated in the RSSP Overall Program Indicators. The corresponding figure from EICV3 is 43.7 percent of individuals in RSSP beneficiary households are below the poverty line (and 50 percent for the comparator group).

[38] Note that this comparison is based on the same EICV3 datasets. The SPIU secured an agreement with the National Institute of Statistics to include a question indicating whether the surveyed household was a RSSP 2 beneficiary or not. This has helped us to determine the percentage of people living under the poverty line in all districts, excluding Kigali-City districts, and excluding RSSP 2 beneficiaries.

[39] These figures are lower than the figures reported under the Phase 3 triggers, because they reflect yields for all farmers in these districts, not just those who benefited from the project. Figures for actual beneficiaries are 6.6 t per hectare, according to RSSP 2 M&E data (2013).

Annex 3: RSSP 2 ICR: Economic and Financial Analysis

Background

1. The PDO of RSSP 2 was to increase agricultural production and marketing in marshland and hillside areas targeted for development under the project in an environmentally sustainable manner. It aimed to sustainably rehabilitate and develop marshlands and hillsides and to strengthen commodity chains for increased commercialization of smallholder agriculture. The project had an original cost of US$ 39.99 million[40] to support three components: (1) Marshlands and Hillsides Rehabilitation and Development; (2) Strengthening Commodity Chains; and (3) Project Coordination and Support. This analysis includes actual costs of US$ 39.3 million consisting of US$ 32.8 million through IDA as well as US$ 4.4 million provided by the Government of Rwanda and an estimated US$ 2 million in beneficiary contributions.[41]

2. Three main benefit streams were included in this economic and financial analysis, with ha and number of facilities shown in Table 1: (1) increased value of production on marshlands; (2) increased value of production and environmental benefits on hillsides through sustainable land management (SLM) practices; and (3) returns on investment in infrastructure for commodity chain development (namely drying floors and grain storage facilities). Project-financed investments and capacity building on marshlands aimed to provide farmers with reliable access to irrigation, allowing them to shift to cultivation of two rice crops per year using improved production methods and reliable irrigation. Construction of soil and water conservation structures and capacity building in the use of integrated soil fertility management practices aimed to increase yields on hillsides. Project-financed drying floors and storage facilities targeted faster and more complete drying and improved storage of crops to reduce storage losses, improve the quality of products, and thus command higher prices in the market. Because evidence shows that project beneficiaries are engaging in cow production and fisheries because of project-induced incomes and infrastructure, unlike the PAD and MTR, the economic and financial analysis (EFA) for the ICR also included project-induced net benefits from fish production using the project-provided irrigation dams and net benefits from cow production made possible through increased beneficiary incomes.

3. The projected number of ha in the PAD Results Framework was exceeded on both marshlands (3,300 ha) and hillsides (9,900 ha). No specific projections were made with respect to the number of rural infrastructure units.

Table 1: RSSP 2 Area, Infrastructure Investments, and Other Project-induced Activities in the EFA

Investment	2008	2009	2010	2011	Total
Marshland developments (ha)	520	520	534	1,750	3,324
Hillside developments (ha)	1,414	1,414	5,528	1,740	10,096
Drying floors (units)	10	10	5	5	30

[40] The original IDA allocation was US$ 35 million. A total of US$ 32.8 million was available/spent, due to exchange rate differences in the SDR (currency of the original funds from the World Bank).

[41] The total actual project costs of US$ 39.3 million included US$ 809,196 paid by the Government of Rwanda as taxes. This amount was included in the financial analysis and excluded from the economic analysis. See also Table 1 in Annex 1.

Storage facilities (units)	6	6	2	2	15
Other project-induced activities:[a]					
Irrigation dams with fisheries (ha)	0	24	91	9	123
Cooperatives with cow production	56	14	11	0	81

Source: RSSP 2 Implementation Status and Results Reports #1-7 (ISRs), and SPIU.
a Not included in the original analysis, and included in the ICR analysis given their apparent importance;

Methodology and Assumptions

4. A 21-year discounted cash flow model was used to assess the economic and financial returns of the project.[42] The analysis focused on the net present value (NPV) of project benefits and costs, before income taxes and financing. With applicable adjustments to the input assumptions, the same model was used as for the PAD and MTR.[43] Annual benefits and costs of marshland and hillside developments were calculated using representative farm models aggregated up to the project level. Similarly, annual returns on rural infrastructure investments were calculated for representative post-harvest infrastructures and then aggregated up to the project level. While net benefits accrue to the cooperative, a representative fisheries model was established on an average per hectare basis and aggregated up to the total area of new irrigation dams (123 ha). Finally, because data were more readily available at the cooperative level, net benefits of cow production were calculated for a single cooperative and aggregated up to the project level based on the number of cooperatives involved in cow production (81 cooperatives). Individual farmers remain the direct beneficiaries of the cow production activities. In general, project interventions have enhanced the efficiency of the market outlets in order for farmers to sell their surplus productions (crops, fisheries, and livestock).

5. **Development investments and other project costs.** In the economic analysis for the PAD, it was assumed that the benefits captured in the EFA model did not reflect the benefits of capacity building for farmers' organizations and cooperatives. As such, the PAD only included a prorated portion of the capacity-building and project management costs, and the analysis covered 87 percent of the US$ 35 million budget. In the ICR it is now argued that not only productive investments but also capacity building are required to capture and sustain the project's incremental net benefits. Therefore, the current EFA analysis covers the full US$ 39.3 million invested through IDA, Government of Rwanda, and beneficiary contributions. The balance of the total budget, not used for developments in Table 1, reflects capacity building and project management in this Annex as well as Table 2 in Annex 2.

6. Although the unit costs for Component 1 varied across sites, the average unit cost of developing and rehabilitating one hectare of marshland without and with a dam (US$ 3,700 and US$ 6,800, respectively) compares favorably with the US$ 13,000 and US$ 22,000 that is respectively spent under a sister ongoing project (LWH) to develop one hectare of irrigated land

[42] The current report is based on results from the Excel model file named: RSSP_EFA_Model_20Jan2013.xlsm.
[43] As emphasized in the ERF for the MTR, some calculation errors were discovered in the EFA Excel model used in the PAD. The calculation errors affected most of the benefit and cost estimates presented in the PAD, although to different extents. Corrections were made to the EFA Excel model during the MTR to establish a baseline for comparison. Details of the corrections can be found in the EFA technical document associated with the MTR. The Project ERR reported in the PAD was 20 percent, with an economic NPV of RWF 8.9 billion. After correcting the EFA model, the estimated Project ERR was 34 percent, with an economic NPV of RWF 24.5 billion.

"without" and "with" a dam.[44] In addition, under RSSP 2 only about US$ 240 per hectare was spent on soil and water conservation on the hillsides; this, in conjunction with other SLM practices, generated a more than fourfold increase in productivity for beans and maize. This outcome is very cost-efficient compared to the US$ 2,300 spent on soil and water conservation on hillsides under LWH to pursue roughly similar yield improvements.[45]

7. The assumptions used in the EFA were identified through the SPIU's Impact Assessment Survey, the OPM impact assessment, and consultation with/inputs from commodity experts in MINAGRI and the SPIU. In addition the following points are used to model the situation using representative farms/units and rural infrastructure, which provided the basis for aggregating the benefits:

- ***Cropping patterns*** without (the counterfactual) and with the project were based on the RSSP 2 experience: sweet potato, paddy rice, banana, maize/bean intercropping, cassava, and fruit trees (papaya). All crops are harvested once a year, except for rice and maize/beans, which have two seasons. It was further assumed that bananas were planted in years 1–4 as areas were developed and then replanted every 10 years. Fruit trees were also planted in the first four years with no replanting during this 20-year analysis. The first banana harvest occurs after one year, and the first fruit harvest after two years. Cassava has an 18-month growing-to-harvest time, so yields and input requirement data have been adjusted by a factor of 2/3 to approximate annual crops. All other cropping costs are assumed to occur each year.
- ***Yield losses*** due to erosion. As in the PAD and MTR, the analysis included a 2 percent annual yield loss due to soil erosion without the project for bananas, maize/bean intercropping, and cassava.[46]
- ***Yield increases*** with and without the project are assumed to build gradually over four years for: paddy rice, bananas, maize-bean intercropping, cassava, napier, and fruit trees. Subsequently, a modest 1 percent annual increase occurs in paddy rice yields, given evidence of MINAGRI's intentions to ensure a constant flow of enhanced technologies, including improved paddy seed.

[44] Hillside irrigation is much more expensive than marshland irrigation for three main reasons. First, the dams used are different. The unit cost of storing one cubic meter is higher for a hillside dam than for a marshland dam. Storing water on a slightly sloping terrain will require a higher dam compared to the kind of dam needed for a marshland, where the same amount of water can cover a bigger area and require a lower dam. The calculations based on the recent works show that the average cost would be US$ 1.5 per cubic meter of water for a marshland dam and US$ 2.2 for a hillside dam. Second, efficient and sustainable hillside irrigation typically requires the main canals to be lined (with masonry) and a secondary pipe network, resulting in higher costs for hillside systems. These requirements account on average for 75 percent of the cost of the irrigation network. For marshlands this infrastructure is unnecessary, given the flat topography and less permeable clay soils. Third, a number of marshlands to be developed just need to be rehabilitated or extended to ensure double cropping and optimal water management, whereas the hillside sites had to be completely developed for irrigation.

[45] RSSP 2 land husbandry technologies were much cheaper compared to the LWH approach. RSSP 2 emphasized progressive terracing, which required the digging of retention ditches; RSSP 2 only piloted radical terracing (the most expensive alternative) on a smaller area (400 ha). On slopes between 6 and 60 percent, LWH requires soil bunds and radical terraces, which are engineering works and hence more costly. It is important to consider that varying topographic and soil conditions will warrant different technologies and investments in RSSP 2, LWH, and other projects. This comparison was carried out to help confirm that the design approach in RSSP 2 endeavored to come up with cost-effective and sustainable approaches. The same SPIU is designing, implementing, and monitoring/evaluating these varying designs, so it will be important for SPIU to help MINAGRI assess the comparative differences appropriate to different conditions.

[46] This result is also in line with findings presented on page 112 in the PAD for the LWH project referring to field experiments in Rwanda and Kenya (Report 50901-RW).

- ***Fisheries.*** Labor components included in the fisheries model are: the labor involved in fishing; quarterly cleaning of the sides of the dam; and annual cost of a watchman. It was also assumed that fishing starts six months after initial stocking of the dam. The dams were stocked only once, and stocking costs were included in Year 1.
- ***Cow production.*** The cow production model was based on an initial herd of 330 cows increasing to a stable size of 620 (of which 150 bulls). Annual purchases of new heifers in Years 1, 2, 3, 4, and 5 onwards were 13, 20, 25, 45, and 60, respectively. Each year male calves, cows over six years, and some female calves were sold to obtain the stable herd number. Costs indicated for stables and forage installations are for Year 1 and incremental increases in Years 2–4 to match the growing herd. The specific benefits from the cows derive from daily milk production and periodic meat and manure sales.
- ***Environmental benefits.*** In line with analyses in the PAD, it was assumed that the adoption of SLM technologies on hillsides would produce off-site environmental benefits in the form of carbon sequestration. Environmental benefits of carbon sequestration were assumed to constitute 0.5 t of carbon per hectare per year with an economic carbon price of US$ 20 per ton.[47]
- ***Technology adoption rates.*** The EFA model enables the analysis of technology adoption rates of less than 100 percent on marshlands and hillsides. This feature was not included in the PAD and MTR analyses, which assumed a rate of 100 percent. As monitored and verified by the RSSP 2 M&E system, the technology adoption rates are high, with an average of 25, 50, 75, and 90 percent in Years 1 through 4.[48] This level of adoption reflects farmers' perceptions of the tangible benefits conferred by the technologies offered through the project. The current analysis assumes that non-adopters can only realize cropping output yields/prices and input quantities/costs equal to those obtained without the project.

8. **Inflation adjustment, discount rate, and exchange rate.** In line with common practice in the World Bank, all costs and prices have been adjusted for inflation to January 2008 (time of appraisal). Also standard for World Bank projects, all US dollar investment costs have been adjusted for inflation using the official Manufactures Unit Value Index (MUV), while all other prices and, for consistency, all other costs have been adjusted using the Consumer Price Index (CPI) obtained from the National Institute of Statistics of Rwanda. The MUV index is generally accepted as a proxy for the price of developing country imports of manufactures in US dollars. A discount rate of 12 percent was used to calculate NPV of the investment in accordance with typical Bank practice (as described, for example, by Belli et al. 1998:179), and for consistency with past practice in Rwandan agricultural operations. The exchange rate was set at RWF 629 per US dollar.

[47] Carbon sequestration of 0.5 t per hectare is in line with ranges reported for different land management practices in Table 5.1 in Falloon et al. (2009) and Table 3.6 in World Bank (2012). Because farmers did not receive direct compensation based on carbon sequestration in this project, sequestration only affected the economic net benefits. The social price of carbon emissions is conventionally calculated as the pollution tax required to keep greenhouse gas (GHG) emissions at the socially optimal level. Expressed in terms of global warming, the optimal level of GHG emissions is the level at which the incremental cost of GHG mitigation is equal to the value of averted damage due to climate change attributable to GHG. The estimated range of economic or social prices in the PAD for RSSP 2 was based on findings in Fankhauser (1995) and compares to financial prices such as those used in Biocarbon Fund projects, where activities that result in increased carbon sequestration are typically compensated at a level of US$ 5/t CO^2 equivalent (= US$ 17/t C; World Bank, 2011c). The value of environmental benefits was RWF 0.3 billion, a modest portion of the total project benefits (see Table 2).

[48] Adoption rate refers to adopting at least two improved technologies.

9. **Economic prices.** In line with the PAD and MTR analyses, it was argued that trade barriers with major trading partners (Uganda, Kenya, Burundi, and Tanzania) are negligible for most goods following the accession of Rwanda to the East Africa Community customs union, and exchange rate distortions are minimal. Therefore the financial and economic prices for tradable goods were assumed identical in the model with the exception of paddy rice. Economic paddy rice price was assumed to be 80 percent of the financial price due to import tariff imposed on rice imported from outside East Africa Community. This assumption is in line with findings in a rice value chain study.[49] With regard to other factors of production, the shadow price of unpaid family labor (economic price) was assumed to be 14 percent below the cost of unskilled hired labor (financial price) used in agricultural production (versus 40 percent used in the PAD). Use of a higher shadow price was considered appropriate in view of the limited alternative employment opportunities for family labor, although with the project the labor market was tighter, with some seasonal shortages.[50] Finally, the financial prices for NPK and urea fertilizers are set at 50 percent of the economic prices because of the fertilizer subsidy. The fertilizer subsidy applies only to maize and wheat production.

Results

10. The "base case" economic NPV is estimated to be RWF 57 billion (US$ 90 million), with an ERR of 47 percent, which compares favorably to the economic NPV estimated at appraisal of RWF 25 billion with an ERR of 34 percent. The financial net present value was RWF 65 billion (US$ 140 million). During the ICR mission it was clear, however, that the project had induced important cow and fish benefits, which were included in an expanded economic analysis. The following ex post analysis therefore includes net benefits from fisheries and cows while making selected references to sensitivity analyses if these net benefits had not been included. The resulting estimated project ERR was 91 percent, with an economic NPV of RWF 85 billion (US$ 135 million) and financial NPV of RWF 93 billion (US$ 148 million), mainly generated through the hillside developments and, to a lesser extent, from the other project investments. The EFA shows that the project's implementation was effective and efficient and that project-supported investments are generating substantial benefits to farming communities in the project area (Table 2). Sixty-eight percent of project returns were generated from the net benefits of crop production on hillsides and thirty-one percent from cow production. Cropping on marshlands and fisheries generated 3 percent of the total NPV. The higher NPV and ERR including cow and fish benefits are also explained by the relatively low cost of the investments to reap those incremental benefits enabled directly by the project. The project's capacity-building activities, including widespread adoption of enhanced technologies, also made important contributions to achieving the favorable NPV and ERR.

11. **Increased returns generated on hillsides are mainly driven by higher yields and output prices.** Note that results show the project's impact to be more favorable than in earlier analyses, particularly because of hillside developments. Improved yields and increased prices are

[49] See Rwanda Rice Commodity Chain Strategic Options to Maximize Growth and Poverty Reduction, prepared by D. Stryker, 2010.

[50] The summary of findings from stakeholder consultations (Nov. 29–Dec. 1, 2012) indicated that job creation was both temporary (through construction) and permanent (through intensification). While labor shortages emerged when cropping activities were at their peak, community labor groups were used to cover labor shortages.

expected outcomes of improved production practices, soil and water management, and capacity building for farmer organizations and cooperatives. The assumptions show that, while many operating costs increased with the project, the benefits increased even more—particularly with respect to higher yields and price differentials between the without- and with-project situations for bananas and cassava. These benefits were not recognized to the same extent during the PAD and MTR analyses.

12. **Cow production generation a considerable share of project returns (31 percent).** The considerable net benefits from project-induced activities included as cow production, amounting to an economic NPV of RWF 27 billion, were not included in the PAD and MTR analyses because they were not foreseen to be important.

13. **Returns on marshland developments were higher than estimated in the PAD, primarily because yields were higher than first expected. Fisheries generated a considerable share of marshland benefits (12 percent).** The assumptions show that operating costs, yields, and output prices for paddy rice increased in the with-project situation. Overall this leads to higher estimated returns than in the PAD, particularly because of higher observed yields. Note that, the assumed paddy rice price of RWF 153 per kilogram was obtained by adjusting the market price, which included benefits from drying and storage.[51] While cropping on marshlands generated an economic NPV of 11.3 billion, project-induced activities included as fisheries in irrigation dams generated an economic NPV of RWF 1.5 billion. With investment costs of RWF 9.9 billion, the total marshland economic NPV was RWF 2.9 billion, as shown in Table 2. As mentioned, the fisheries benefits were not included in the PAD and MTR analyses primarily because they were not foreseen to become important. Because the marshland investment costs were subsidized by the government, the beneficiary farmers still perceive and receive substantial financial returns from these marshland investments.

14. **The estimated return on rural infrastructure investments was RWF 2.4 billion, with an ERR of 129 percent, which is lower than in the PAD analysis because actual unit investment costs increased substantially (for reasons already stated).** The projections in the PAD and MTR analyses included 48 drying floors and 48 storage facilities, which are much higher than the final numbers of 30 and 15 units, respectively. As indicated by the SPIU, the scope was adjusted to stay within budget, given the doubling of the actual unit cost of drying floors and nearly trebling of the unit cost of storage facilities.

15. **The financial return on project investments is higher than the economic NPV. The difference between financial and economic NPV is caused by the adjustment for the economic paddy rice price, the fertilizer subsidy, and the shadow price of labor.** In the PAD analysis the shadow price of labor was 40 percent below the financial price, while in the ICR it is assumed to be 14 percent below. This adjustment is in line with findings during the ICR field trip, when beneficiary consultations revealed that alternative labor opportunities had increased and that labor shortages remain during certain periods owing to the intensification of crop

[51] According to SPIU's farm survey, the paddy rice price was RWF 226 per kilogram (2008 prices; RWF 300 per kilogram in 2012 prices), including benefits of drying and storage. Adjustments were made for the quantity and price losses that were avoided, but only half of the harvested rice is dried and stored, achieving full benefits ((15%+15%+15%+20%)*50%=32.5% of farm gate price).

production. On the other hand, the economic NPV is lower than the financial NPV because the economic prices for paddy rice and fertilizer were adjusted for import duties and the fertilizer subsidy, respectively.

Table 2: NPV and ERR by Subcomponent: Assumptions from the PAD (original EFA), MTR, and current ICR

Description/ Source of Benefits	PAD/Original EFA			MTR 2010			ICR: Base Case (excluding fish and cows)			ICR Scenario 2 (including fish and cows)		
RWF million	FIN NPV	ECON NPV	ERR %	FIN NPV	ECON NPV	ERR %	FIN NPV	ECON NPV	ERR %	FIN NPV	ECON NPV	ERR %
Marshlands	-4	1	15%	13	15	43%	8	1	14%	9	3	17% [b]
Hillsides:												
Crop production	11	11	30%	8	9	N/A	58	58	170%	58	58	170%
Env. benefits [c]		0.3	N/A		0.3	N/A		0.3	N/A		0.3	N/A
Rural infrastructure	14	14	N/A	14	15	N/A	4.6	2.4	129%	4.6	2.4	129%
Cow production										27	27	N/A
Other [a]	-2	-2	N/A	-2	-2	N/A	-6	-5	N/A	-6	-5	N/A
Total project	19	25	34%	32	37	58%	65	57	47%	93	85	91%

Note: "N/A" indicates a rate of return that cannot be calculated with a net profit received already in the first year. The NPVs for marshlands and rural infrastructure were artificially high for the MTR analysis, because the assumed paddy rice price was the same in financial and economic prices (when the economic price should have been adjusted lower), and the farm gate paddy rice price included benefits from drying and storage (thereby double-counting benefits also included under rural infrastructure).
a "Other" constitutes capacity building and project management. Benefits are captured in other line items.
b Includes net benefits from fishery.
c For assumptions and methodology, see para. 7.

16. **As an indicator of improved household incomes, the estimated financial gross margins reflected in the model's representative farm models increased by 355 percent on marshlands and increased by 61 percent on hillsides.** Table 3 shows that, with the current assumptions, the estimated financial gross margin on marshlands when switching from sweet potato to irrigated rice increased from a baseline of US$ 428 per hectare to US$ 1,951 per hectare (a 355 percent increase). With the assumed changes in cropping pattern on hillsides, financial gross margin increased by 61 percent from a baseline of US$ 1,699 per hectare to US$ 2,735 per hectare. Based on an average farm size of 0.2 hectare, the gross margin analysis indicates a substantial increase in household income on marshland areas (from US$ 86 to US$ 390) and on hillsides (from US$ 340 to US$ 547).

Table 3: Financial Gross Margin, with and without RSSP 2

Financial Gross Margin	Year 3			Year 4		
	RWF/ha	US$/ha	Change, %	RWF/ha	US$/ha	Change, %
Marshlands (cropping):						
Gross margin, without project	269,420	428		269,420	428	
Gross margin, with project	1,189,497	1,891	+342%	1,227,040	1,951	+355%
Hillsides (cropping):						
Gross margin, without project	473,955	754		1,068,444	1,699	

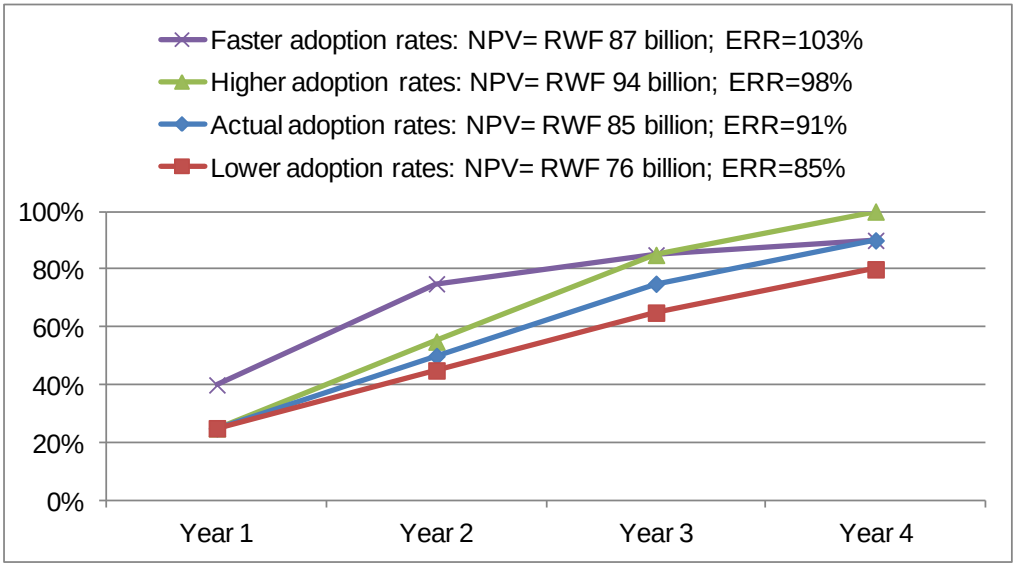
Gross margin, with project	665,477	1,058	+40%	1,720,115	2,735	+61%

Note: Excludes fisheries and cow production. Financial gross margins are calculated before income taxes and financing. The gross margins are for Year 3, when there are planting costs and yield revenue from both bananas and fruit trees, and for Year 4 when more but not all of the yield benefits have been realized.

17. **Because the project exceeded the target number of ha developed on marshlands and hillsides, there were no missed opportunities.** The project team attributed the increase in marshland development costs to growing demand for limited capacity in Rwanda's construction industry, increases in input/material costs, and the impact of the global financial crisis. Marshland developments were selected to stay within the current project budget. Several marshland developments that had been identified for implementation, and which had higher unit costs, were instead deferred to the third phase of RSSP.

18. **The project achieved an impressive farmer technology adoption rate of 90 percent after four years, which has been monitored and verified by the project M&E system; if the project had only achieved an 80 percent adoption rate, the economic NPV would have fallen from RWF 85 billion to RWF 76 billion when fisheries and cows are included.** As noted, 10 percent of farmers did not adopt the project technology on marshland and hillside developments. They were therefore unable to increase their productivity and obtain the increased prices and cost savings obtained by farmers who did adopt the technology. Figure 1 shows the potential impact of different levels of adoption. Had the project obtained 100 percent technology adoption on developed areas, the NPV could have increased from RWF 85 billion to RWF 94 billion. The equivalent result when excluding fisheries and cows was an increased NPV from RWF 57 billion to RWF 66 billion. On the other hand, the project NPV with fisheries and cows could have fallen to RWF 76 billion if adoption rates had only reached 80 percent of developed areas. Equivalently, the NPV could have fallen to RWF 48 billion with an 80 percent adoption rate when excluding fisheries and cows. There is also evidence that these technology improvements will be sustained by farmers, given that technology services are in place to ensure continuous flow of improved technologies. While not shown in the figure, the analysis identified the importance of sustaining technology improvements: If the current 1 percent annual yield increase assumed on paddy rice was not sustained, the marshland economic NPV would fall from RWF 2.9 billion to RWF 1.5 billion (-48 percent). The equivalent result when excluding fisheries and cows was that the economic NPV would fall from RWF 1.4 billion to zero.

Figure 1: Economic NPV with Different Technology Adoption Rates in Marshlands and Hillsides



Note: Adoption rate refers to adopting at least two improved technologies. NPV and ERR include fisheries and cows.

19. **Depending on the net benefits of an additional US$ 5 million spending on capacity building, the economic NPV could increase from RWF 85 billion to RWF 89 billion when fisheries and cows are included.** Project returns improve with increased capacity-building activities at the cooperative level for further technology transfer and enhanced cooperative business skills. Current capacity building enabled farmers to further: (i) increase their yields; (ii) increase their ability to obtain higher output prices; (iii) reduce their input use without losing yield or price advantages; (iv) increase their ability to purchase inputs at lower cost; and (v) embark on profitable enterprises, as they diversify and expand their value chain. Table 4 illustrates some possible scenarios in which an additional US$ 5 million spent on capacity building could lead to different level of benefits. For example, if no additional benefits were achieved, the economic NPV would drop from RWF 85 billion to RWF 83 billion. On the other hand, the economic NPV would increase only to RWF 89 billion if one could achieve a 4 percent increase in revenue (through a 0.5 percent increase in yields and prices across the board) and a 4 percent decrease in input costs (through a 1 percent decrease in input use and costs across the board). The equivalent result when excluding fisheries and cows was that the estimated economic NPV of RWF 57 billion could vary between RWF 54 and 59 billion.

Table 4: Changes in NPV with Increased Investment in Capacity Building and Different Effects on Output and Input Factors

Economic NPV, RWF billion		x% decrease in NPV of input costs		
		0%	-2%	-4%
x% increase in NPV of revenue	0%	82.6	83.3	83.9
	2%	85.4	86.0	86.6
	4%	88.0	88.6	89.3

Note: Additional capacity building budget = US$ 5 million. Base case economic NPV = RWF 85 billion without this increased budget and associated benefits. A 2% (4%) increase in revenue requires a 0.5% (1%) increase in all yields and output prices. A 2% (4%) decrease in input costs requires a 0.5% (1%) decrease in all inputs and input costs. Includes fisheries and cows production factors.

20. **Total project returns are not very sensitive to changes in assumptions, but returns on the marshland subcomponent could be erased by a 10 percent fall in paddy rice price/yield or a 29 percent increase in investment costs when fisheries benefits are included.** Switching values indicate how much a single unit price/cost variable has to change to make economic NPV zero—while holding all other variables fixed. The switching values were calculated for the project as a whole as well as separately for each subcomponent (Tables 5 and 6). The project return is most, but not very, dependent on yield and prices/costs on hillside crops and cows (Table 5). For example, using the assumptions from the PAD, the rice price would have to fall by 53 percent, to RWF 70 per kilogram, before resulting in negative returns. In the current ICR analysis, the with-project banana price would have to fall from RWF 67 per kilogram to RWF 9 per kilogram (-87 percent) before the project returns become zero. The equivalent result when excluding fisheries and cows was that banana price would have to fall by 58 percent to RWF 28 per kilogram before project returns become zero. When we look at each subcomponent separately, the results for the marshland subcomponent are more sensitive to changes in yields, prices, and costs. A 10 percent fall in rice price/yield or 29 percent increase in investment costs would lead to no returns on marshland areas (including fisheries). If we exclude fisheries, the rice price would have to fall by 4 percent or the investment costs would have to increase by 14 percent before project returns become zero. For hillside development it would take a 60 percent reduction in the banana price or yield to erase returns (including environmental benefits). And a 28 percent fall in the paddy rice price would make the rural infrastructure subcomponent break even. The economic NPV of cow production would turn zero if the number of initial cows per cooperative fell by 32 percent or if the milk price/yield fell by 34 percent. It should be noted that marshland development contributes to a transformation of the rural sector by enabling investment in other productive activities such as cows. Field visits also showed that many farmers adopted the improved practices *after* they had witnessed substantial income increases from the marshland schemes.

21. The following discussion will focus on the validity of the current assumptions in light of their relative effect on project returns: Crop yields, crop prices, investment costs, and input costs.

Table 5: Switching Values, Total Project (Original EFA and ICR)

		Original EFA			ICR			
Variable	**Unit**	**Base**	**Switching Value**	**Absolute % difference**	**Base**	**Switching Value**	**Absolute % difference**	**Economic NPV = 0**
Paddy rice price W/P	RWF/kg	150	70	53%				Project
Paddy rice yield W/P	kg/ha	5,000	1,075	79%				Project
NPK price	RWF/kg	350	1,111	217%				Project
Investment costs in irrigation	US$/ha	6,000	21,379	256%				Project
Economic labor unit costs	RWF/day	300	1,216	305%				Project
Investment cost on hillsides	US$/ha	500	5,626	1025%				Project
Banana-Yield-W/P	kg/ha				59,434	24,719	58%	Project
Banana-Price-W/P	RWF/kg				67	28	58%	Project
Banana-Price-WO/P	RWF/kg				47	99	111%	Project
Cassava-Price-WO/P	RWF/kg				101	395	290%	Project
Marshlands-Initial irrigation capital investment	USD/ha				6,670	44,796	572%	Project
Sweet Potato-Yield-WO/P	kg/ha				6,000	56,227	837%	Project
Sweet Potato-Price-WO/P	RWF/kg				67	631	837%	Project
Paddy rice-Labor-W/P-Season A	day/ha				400	4,586	1046%	Project

Note: W/P = with-project situation; WO/P = without-project situation. Excludes fisheries and cows in ICR analysis. Yields are shown for Year 1, before the full yield increase has occurred, but the switching value is calculated based on the full yield increase being achieved in project.

Table 6: Switching Values: ICR EFA (Marshland and Hillside Developments, Rural Infrastructures, and Cow Production)

		ICR			
Variable	**Unit**	**Base**	**Switching Value**	**Absolute % difference**	**Economic NPV = 0** [3]
Paddy rice-Price-W/P-Season A	RWF/kg	153	145	5%	Marshland
Paddy rice-Yield-W/P-Season A	kg/ha	6,121	5,803	5%	Marshland
Investment costs in irrigation	US$/ha	6,670	7,591	14%	Marshland
Sweet Potato-Price-WO/P	RWF/kg	67	7,215	20%	Marshland
Sweet Potato-Yield-WO/P	kg/ha	6,000	81	20%	Marshland
Paddy rice-Labor-W/P-Season A	day/ha	400	501	25%	Marshland
Banana-Price-W/P	RWF/kg	67	27	60%	Hillside
Banana-Yield-W/P	kg/ha	59,434	23,829	60%	Hillside
Banana-Price-WO/P	RWF/kg	47	101	114%	Hillside
Cassava-Price-WO/P	RWF/kg	101	402	298%	Hillside
Maize-Bean Intercrop-Labor-W/P-Season A	day/ha	350	5,607	1502%	Hillside
Maize-Bean Intercrop-Price-WO/P-Season A	RWF/kg	81	1,585	1861%	Hillside
Banana-Manure-W/P	kg/ha	20,000	410,516	1953%	Hillside
NPK-Financial	RWF/kg	168	3,863	2194%	Hillside
Manure price	RWF/kg	7	160	2276%	Hillside
Hillsides-Initial hillside capital investment	US$/ha	415	12,894	3004%	Hillside
Paddy rice-Price-W/P-Season A	RWF/kg	153	111	28%	Rural Infr.
Quantity dried/ stored per period-Drying Floors	t/month	225	142	37%	Rural Infr.
Material Costs-Drying Floors	mill RWF/ month	1.35	2.35	75%	Rural Infr.
Material Costs-Storage Facilities	mill RWF/ month	2.02	3.97	97%	Rural Infr.
Drying Floors-Initial Capital Investment	mill RWF/unit	14.24	115.17	708%	Rural Infr.
Storage Facilities-Initial Capital Investment	mill RWF/unit	21.37	217.52	918%	Rural Infr.
Labor price - financial	RWF/day	471	46,848	9836%	Rural Infr.

Note: W/P = with-project situation; WO/P = without-project situation. Yields are shown for Year 1, before the full yield increase has occurred, but the switching value is calculated based on the full yield increase being achieved in four years. Marshlands also include fisheries production. Hillsides also include environmental benefits.

22. **Use of national yield and price data was limited to validating key assumptions.** Note that because RSSP 2 does not cover significant shares of any districts, district-level data for prices and yields cannot be used to reveal direct impact from RSSP 2 investments. Instead, national data from MINAGRI and e-Soko online databases are used below to validate key assumptions of the EFA model by showing national averages for the period before the project began (2006–07) and the period of project implementation (2008–11).

23. **Currently assumed yield levels correspond well to national data for Rwanda, except banana and cassava yields. If no yield benefits had been obtained on hillside crops, the economic NPV would have fallen from RWF 85 billion to RWF 47 billion and the ERR would have fallen from 91 percent to 58 percent.** Because yield, price, and cost assumptions are the factors that drive the estimated project returns, data from other comparable sources were obtained to examine the validity of current EFA assumptions. Using data from MINAGRI, Table 7 shows that the yield assumptions for sweet potato and maize/beans lie close to the national data for Rwanda in both time periods. The national data for paddy rice includes both irrigated and unirrigated rice, so it is expected that the current assumption of 6,500 kilograms per hectare for

irrigated rice lies above the national average. The project yields for bananas and cassava are much higher than the national average, but they are achievable and have been verified by the project team and MINAGRI experts. It should be noted that district officials selected project areas with low yields and good potential for increases. The assumption was that capital investments, together with capacity building, would enable farmers to increase their yields to the with-project levels shown in Table 7. Had these higher yields not been obtained on hillsides in spite of capacity building, higher output prices, and higher input costs, then the economic NPV would have been only RWF 47 billion with an ERR of 58 percent. If we exclude fisheries and cows, the project economic NPV when no yield effects are obtained on hillsides would have been only RWF 19 billion, with an ERR of 24 percent.

Table 7: Current Yield Assumptions Compared to Rwanda Yield Data, 2006–07 and 2008–11

kg/ha [a]	Sweet Potato		Paddy Rice [b]		Banana		Maize+Bean [c]		Cassava	
	2006-07	2008-11	2006-07	2008-11	2006-07	2008-11	2006-07	2008-11	2006-07	2008-11
Current EFA Assumption:										
WO/P	6,000				55,000		1,500		23,333	
W/P	-			6,500		75,000		4,000		25,000
Rwanda National Data (MINAGRI):										
Minimum	5,435	5,434	3,422	4,318	6,753	7,365	1,521	1,570	5,155	11,533
Average	5,657	6,560	4,399	5,063	7,431	8,317	1,637	2,725	5,954	13,269
Maximum	5,898	8,086	5,006	5,942	7,726	9,340	1,737	3,764	7,573	15,411

Source: MINAGRI Crop Assessment Reports.
a All average yields are weighted by planting area for each crop by region and year.
b Rice yields reported by MINAGRI combine both irrigated and non-irrigated rice.
c Maize and bean intercropping is approximated through a weighted average of maize and bean yields.

24. **Output prices, except for paddy rice, were relatively low compared to 2008–11 e-Soko data. By obtaining the national average in without- and with-project prices, the economic NPV decreased from RWF 85 billion to RWF 67 billion.** The assumed output prices were compared to averages based on e-Soko commodity price data. Table 8 shows that the assumed without- and with-project prices were relatively low compared to the national averages. A few sensitivity analyses were conducted to explore the effect of price changes (Table 9). For example, by obtaining the national average for without- and with-project prices, the economic NPV decreased from RWF 85 billion to RWF 67 billion and an ERR of 68 percent. The equivalent result when excluding fisheries and cows was that the economic NPV would fall from RWF 57 billion to RWF 39 billion with an ERR of 33 percent. In a worst-case scenario, if the captured output prices were combined with no yield benefits on hillsides, the economic NPV including fisheries and cows could have fallen to RWF 19 billion and an ERR of 26 percent. No assessment was made as to the probability of these price and yield changes occurring either separately or together.

Table 8: Current Output Price Assumptions Compared to Rwanda National Average, 2009–11

RWF/ha [a]	Sweet Potato		Paddy Rice [b]		Banana		Maize+Bean c		Cassava	
	2006-07	2008-11	2006-07	2008-11	2006-07	2008-11	2006-07	2008-11	2006-07	2008-11
Current EFA Assumption:										

WO/P	67				47		81		101	
W/P	-			153		67		135		135
Rwanda National Averages (e-Soko):										
Minimum	57	12	303	146	84	11	137	47	138	53
Average	86	73	321	278	106	88	168	162	174	148
Maximum	120	252	340	378	119	410	207	477	209	326

Source: e-Soko database of commodity prices by province, district, market, commodity, and day, accessed November 28, 2012. http://www.esoko.gov.rw.

a All prices have been inflation adjusted to January 2008 using CPI from Rwanda Statistics.

b Original e-Soko price for rice adjusted for paddy in line with the PAD EFA (multiplied by 67%). The data covers all qualities of rice.

c Only maize prices available for the period.

Table 9: Economic NPV with Different Levels of Revenue Factors on Marshlands and Hillsides

Changes to Revenue Factors (billion RWF)	Economic NPV		
No yield improvements on hillsides	47		
WO/P prices obtained equal to national averages in Table 8	2	67	19
W/P prices obtained equal to national averages in Table 8	151		
Base case	**85**		

Note: Other factors were maintained as in the base case. Includes fisheries and cows.

25. **The project has avoided inefficiencies by keeping unit investment costs on marshlands considerably below the regional average.** The currently assumed US$ 6,670 per hectare unit capital investment cost for irrigation development is low compared to averages for Sub-Saharan Africa as reported by Inocencio et al. (2005). That research report included several irrigation systems and indicated that successful irrigation projects in Sub-Saharan Africa had unit costs averaging US$ 3,552 per hectare compared to less successful projects averaging US$ 17,396 per hectare (inflation adjusted to 2008 prices).[52] For comparison with the current EFA model, Table 10 shows that lowering the assumed unit costs to those designated as successful, increased the economic NPV to RWF 90 billion. By keeping unit costs substantially below those found in unsuccessful projects by Inoncencio et al (2005), the project prevented the current economic NPV from falling from RWF 85 billion to RWF 69 billion and prevented the marshland subcomponent from giving negative returns. As noted, a 29 percent increase in investment costs in marshlands would erase the return on this subcomponent. If we exclude fisheries and cows, keeping unit costs low has prevented the economic NPV from falling from RWF 57 billion to RWF 41 billion with negative returns on the marshland subcomponent.

Table 10: Marshland Total Economic NPV with Different Levels of Unit Investment Costs

Changes to Unit Investment Costs	Economic NPV (billion RWF)			
	Total	Marshland	Total	Marshland
No yield improvements on hillsides	47	2.9	51	7.6
Marshlands: Initial irrigation capital investment reduced to US$	90	7.6		

[52] The Inocencio et al. (2005) report covers 314 investment projects by the World Bank, AfDB, and IFAD. Using 2000 prices the range of unit hardware costs was USD 2,866/ha in South Asia increasing to USD 10,473/ha in Sub-Saharan Africa. In that report hardware costs are defined as total project investment costs excluding agriculture supports and institution building. The study by the Irrigation Water Management Institute reported on unit costs as an average for all types of irrigation systems such as: River-diversion; river-dam-reservoir; tank; river-lift; groundwater-lift; and drainage/flood control.

3,500/ha (-48%)		
No yield improvements on hillsides	47 2.9	
Marshlands: Initial irrigation capital investment increased to US$ 17,400 ha (+161%)	69 -13.1	31 -13.1
Base case	**85**	

Note: Other factors were maintained as in the base case. Includes fisheries and cows.

26. **While some input costs may have been considerably higher or lower than what was assumed in the model, the overall effect would have been very small, maintaining the economic NPV above RWF 80 billion and an ERR of 84 percent.** The e-Soko database also includes time-series data of NPK and urea fertilizer prices. The current assumptions that these prices were RWF 337 per kilogram and RWF 323 per kilogram, respectively, were close to the district averages of RWF 350–300 per kilogram calculated from the e-Soko database.[53] By considering the minimum and maximum prices in the data set, it was found that these prices could have been 40 percent lower or 80–90 percent higher. It was also recognized that in earlier EFA analyses of the project, the economic price of labor was 40 percent below the financial price, rather than 14 percent as in the current assumptions. The separate and combined effects on economic NPV of all these cost factors were very small, as shown in Table 11. The economic NPV varied between RWF 80 billion (ERR = 84 percent) and RWF 89 billion (ERR = 100 percent). When excluding fisheries and cows in the cases analyzed in Table 11, the economic NPV varied between RWF 51 billion (ERR = 43 percent) and RWF 61 billion (EFF = 50 percent). It was not possible to obtain other comparable input cost data to extend this analysis.

Table 11: Economic NPV with Different Levels of Cost Factors on Marshlands and Hillsides

Changes to Cost Factors	Economic NPV (billion RWF)	
NPK fertilizer prices increases by 90%; urea fertilizer price increases by 80%	80	81
Economic price of labor is 40% below financial price rather than 14%	87	
NPK and urea fertilizer price decrease by 40%	88	89
Economic price of labor is 40% below financial price rather than 14%	87	
Base case	**85**	

Note: Other factors were maintained as in the base case. Includes fisheries and cows.

27. As for the PAD, this analysis did not include benefits generated by project-supported activities that could be transferred outside the project area through trained farmers interacting with other communities (spillover effects that appear to be important but were not monitored). Other project-induced production activities also generated important benefits to participating cooperatives and their members, such as beekeeping and rabbit raising introduced in project communities; straw from rice paddy fields used as fodder for cows and organic fertilizer for crops; and manure from rabbits used for fish feed. Benefits are also expected to extend beyond the 21-year time-frame included in this analysis.

Source: EFA analyses models for PAD and MTR (data provided by project team and the SPIU). ICR assumptions provided by Single Project Implementation Unit (SPIU) in November 2012 prices and adjusted to 2008 prices. Data were obtained from farmer survey. CPI deflator: Rwanda Statistics:

[53] Includes e-Soko data for 2009–11 accessed November 28, 2012. All prices have been inflation adjusted to January 2008 using CPI from Rwanda Statistics.

http://statistics.gov.rw/index.php?option=com_content&task=view&id=262&Itemid=308. MUV: World Bank: http://go.worldbank.org/DZLIAJ2730

Note: 1. Initial unit costs for capital investments for marshlands, hillsides, drying floors, and storage facilities are calculated from actual investment costs divided by the number of units. They include costs covered by IDA, Government of Rwanda, and beneficiary contributions.

2. Yields WO/P: Bananas, maize/bean intercropping, and cassava yields in without-project situation are reduced by 2% annually to reflect soil erosion.

3. Yields W/P: Yield increased in with-project situation for paddy rice, banana, maize-bean intercropping, cassava, napier, and fruit trees is assumed to occur gradually over 4 years. Subsequently, there is a 1% increase in paddy rice yield each year.

4. According to farm survey the paddy rice price was RWF 226/kg (2008 prices; RWF 300/kg in 2012 prices) including benefits of drying and storage benefits. Adjustments were made for avoided quantity and price losses as shown in the table above but only half of the harvested rice is dried and stored achieving full benefits ((15%+15%+15%+20%)*50%=32.5% of farm gate price).

5. The 50% fertilizer subsidy does not apply to paddy rice production.

6. Fish harvest and labor costs are 50% in Year 1.

7. The cow production model was based on an initial herd size of 330 cows increasing to a stable herd size of 620 (of which 150 bulls). Annual purchase of new heifers in years 1, 2, 3, 4, and 5 onwards were 13, 20, 25, 45, and 60 respectively. Each year male calves, cows over 6 years, and some female calves were sold to obtain the stable herd number. Costs indicated for tables and forage installations are for Year 1 and incremental increases in Years 2-4 to match the growing herd.

8. Deflator for RWF: CPI Sep 2012 = 100 and Jan 2008=67.Deflator for US$: MUV 2012=100 and Jan 2008=97.1.

Annex 4: Bank Lending and Implementation Support/Supervision Processes

(a) Task Team members

Names	Title	Unit	Responsibility/ Specialty
Lending			
Michael Morris	Lead Agricultural Economist	AFTAR	Task Team Leader
Soulemane Fofana	Operations Officer	AFTAR	Operations Officer
Otieno Ayany	Financial Management Specialist	AFTFM	Financial Management Specialist
Chantal Kajangwe	Procurement Analyst	AFTPC	Procurement Analyst
Toni Kayonga	Operations officer	AFTSD	Operations officer
Anushika Karunaratne	Consultant	AFTN1	Consultant
Yasmine Umutoni	Team Assistant	AFMRW	Team Assistant

Loraine Ronchi	Economist	AFTAR	Economist
Marie-Louise Ah-Kee	Procurement Analyst	AFTAR	Procurement Analyst
Guillemette Jaffrin	Financial Sector Specialist	SASFP	Financial Sector Specialist
Victoria Gyllerup	M&E Specialist	MNADE	M&E Specialist
Patrice Sade	Team Assistant	AFTAR	Team Assistant
Mary Bitekerezo	Social development Specialist	AFTCS	Social development Specialist
Sergiy Zorya	Economist	AES	Economist
Diego Garrido	M&E Specialist	AFTRL	M&E Specialist
John Boyle	Senior Environmental Specialist	AFTEN	Senior Environmental Specialist
Non World Bank Staff			
Josep Gari	Community Development Specialist, FAO	FAO	
Amadou Soumaila	Irrigation Engineer, FAO	FAO	
Supervision/ICR			
Pin Foon K. F. Ah-Kee	Procurement Analyst	AFTA1	Procurement Analyst
Otieno Ayany	Financial Management Specialist	AFTME	Financial Management Specialist
Mary C.K. Bitekerezo	Senior Social Development Spec	EASDE	Senior Social Development Spec
Martin Fodor	Senior Environmental Specialist	AFTN3	Senior Environmental Specialist
Diego Garrido Martin	Monitoring & Evaluation Specialist	AFTDE	M&E Specialist
Chantal Kajangwe	Procurement Specialist	AFTPE	Procurement Specialist
Toni Ntaganda Kayonga	Consultant	AFTCS	Operations Officer
Michael Morris	Lead Agriculture Economist	AFTA2	Task Team Leader
Valens Mwumvaneza	Rural Development Specialist	AFTA2	Rural Development Specialist
Patrice Sade	Program Assistant	AFTA2	Program Assistant
Yasmine Umutoni	Consultant	AES	Team Assistant
Mark A. Austin	Senior Operations Officer	AFTAR	Task Team Leader
Loraine Ronchi	Senior Economist	AFTAR	Task Team Leader
Noreen Beg	Senior Environmental Specialist	AFTEN	Sr Environmental Spec
Svetlana Khvostova	Operations Analyst	AFTOS	Information Analyst
Hardwick Tchale	Senior Agriculture Economist	AFTAR	Sr Agriculture Economist
Pascal Tegwa	Senior procurement Specialist	AFTPE	Sr Procurement Specialist
Antoinette Kamanzi	Procurement Assistant	AFMRW	Procurement Assistant
Belinda Mutesi	Team Assistant	AFMRW	Team Assistant
Paul Welton	E T Consultant	AFTME	Sr Financial Management Specialist
Sameena Dost	Senior Counsel	LEGAF	Senior Counsel
Wolfgang Chadab	Financial Officer	LOAG2	Financial Officer
Marie-Louise Ah-kee	Procurement Analyst	AFTAR	Procurement Analyst
Pierre Morin	Sr. Procurement Specialist	AFTPC	Sr. Procurement Specialist
John A. Boyle	Sr. Environmental Specialist	AFTEN	Sr. Environmental Specialist
Soulemane Fofana	Operations Analyst	AFTAR	Operations Analyst
Korotimi Sylvie Traore	Language Program Assistant	AFTAR	Language Program Assistant
Marie Jeanne Uwanyarwaya	Program Assistant	AFMRW	Program Assistant
Guillemette Jaffrin	Financial Sector Specialist	AFTFS	Financial Sector Specialist
Anushika Karunaratne	Consultant	AFTAR	Consultant
Rodrigue Djahlin	Consultant	AFTAR	Consultant

Richard Anson	Consultant		ICR Mission Leader
Alex Mwanakasale	Senior Agricultural Specialist	AFTA3	Senior Agricultural Specialist
Meena Munshi	Senior Economist	AFTA3	Social development Specialist
Abel Lufafa	Agricultural Officer	AFTA3	Soil Specialist
Alice Usanase	Junior Professional Associate	AFMRW	Private Sector Specialist
Hild Rygnestad	Consultant	PRMED	Consultant
Elizabeth Mutesi	Procurement Analyst	AFTPE	Procurement Analyst

Non World Bank Staff

Amadou Soumaila	Irrigation Specialist, FAO	Rome, Italy	
Alberta Mascaretti	Agricultural Specialist, FAO	Rome, Italy	
Thierry Lassalle	Organizational development and Capacity Development	Rome, Italy	
Josep Gari	Community Development Specialist	FAO	
Derek Baker	Agribusiness Specialist	FAO	

(b) Staff Time and Cost

Stage of Project Cycle	Staff Time and Cost (Bank Budget Only)	
	No. staff weeks	US$ Thousands (including travel and consultant costs)
Lending		
Bank Admin. Funds		661,643
BB-FAO		251,910
Total:		913,553
Supervision/ICR		
Bank Admin. Funds		699,624
BB+FAO		182,950
Total:		882,574

Annex 5: Summary of Key Findings - Stakeholder Impact Assessment Study for RSSP 2 (February 2012)[54]

1. This Impact Assessment report discusses first the activities carried out under RSSP 2 and then the impact these have had on supported households, in terms of farming behavior, living conditions and well-being. It uses a mixed-methods approach, combining qualitative and quantitative research techniques, to assess impact and attribute it to RSSP 2.

2. **Infrastructure**. Under RSSP 2, the project rehabilitated and developed marshlands and hillsides and provided facilities such as drying bays and storage space. Respondents in RSSP-supported cooperatives are aware of the benefits and grateful for the extent of RSSP support in terms of providing such infrastructure and facilities. Users express a high degree of satisfaction. Users of irrigation dams, rivers weirs or other water intakes were very satisfies at 70%; 64% of users of irrigation canal were very satisfied while 35% were quite satisfied. 73% of farmers in the marshlands were very satisfied of soil erosion control infrastructures used to protect the irrigated marshland. Of the 70% HHs that access drying facilities 65% were very satisfied. The same levels of satisfaction were expressed for HHs with access to storage facilities. With regards to soil erosion control structures beneficiary HHs were very satisfies at 70% and quite satisfied at 20%

3. Most cooperative members who were asked about their expectations regarding the sustainability of such infrastructure were positive in their responses. They appeared to feel strong ownership of such infrastructure and recognize the advantages of their access to it, so they were happy to contribute to its upkeep. A frequent request from beneficiary farmers was for further extension of agricultural facilities such as drying yards and storage facilities. Respondents repeatedly pointed out that production had gone up to the point of outstripping the provision of facilities to handle post-harvest activities in terms of size, number, and distance from farmers.

4. RSSP 2 piloted WUAs in the marshlands to encourage sustainable management of water. Reaction to the WUAs was universally positive among respondents. The associations are seen to provide more equitable water distribution and reduce community conflict.

5. **Cooperative strengthening.** RSSP initiatives are positively affecting the structure and accountability of supported cooperatives. Since the introduction of RSSP support, these cooperatives now have better book-keeping procedures and records in place, have set up new committees with specific mandates such as marketing or post-harvest management, have established a small group structure, and some have put in place new management teams. The revenues of supported cooperatives have witnessed a significant increase in recent years. In all of the cooperatives visited, membership had also increased in recent years. However, many farmers are still not members of cooperatives due to mistrust, a lack of understanding of the purpose and benefits of cooperative membership, as well as financial barriers to membership. With the

[54] The following section is a summary taken from Volume 2 of the Impact Assessment Study carried out for RSSP 2 by an independent evaluation team ("RSSP 2 Performance Indicators Update and Impact Assessment: Volume 2: Impact Assessment, prepared by the Oxford Policy Management"). For further details, see the complete study (Volumes 1 and 2). Volume 1 focuses on assessing the results framework achievements, and Volume focuses on the stakeholder assessment, using sound qualitative and quantitative methods.

support received from RSSP 2, beneficiary cooperatives develop fast in terms of asset accumulation and thereby entry barriers. It is important that alternative mechanisms are found to ensure that poorer households are not excluded from joining beneficiary cooperatives in the future. Some supported cooperatives already allow the payment of membership fees in installments, or after the harvest. Such initiatives should be encouraged and further developed by RSSP.

6. **Training**. RSSP 2 provided training in various areas, such as cooperative organization, crop intensification, and water management, among others. The project adopted a Training of Trainers approach to teaching farmers. Initially training was provided to Local Service Providers, which in turn trained lead farmers. The lead farmers subsequently trained farmer groups within their cooperatives. In general farmers understood the practicality of the Training of Trainers approach and were content with this mode of training. An overwhelming majority of farmers found the training to be very useful and one of the main factors in improving their standard of living.

7. Training provided by RSSP was stated as one of the key factors in increasing agricultural output. Farmers argued that it was not only the inputs but also rather the knowledge on which, how, and when the inputs were combined and used that resulted in increased output. When asked whether all the training received was applied to their day-to-day activities, the majority of farmers reported to have applied most of the training they had received. Furthermore, most farmers had already seen the benefits of these methods and felt they could never go back to farming with previously used, traditional methods. Nevertheless farmers felt that training needed to be a continuous process with repeated follow-ups to ensure full integration and application by all farmers.

8. **Agricultural production**. All of RSSP 2's activities discussed above have the aim of improving agricultural productivity and thereby improving the quality of life of supported households and revitalizing the rural economy. Interviews with farmers suggested that their yields had increased in recent years. Those increases were attributed to the support provided by RSSP 2 on infrastructure as well as the use of modern technologies and improved inputs.

9. RSSP 2 encouraged the use of modern agricultural inputs, such as fertilizers and pesticides. In marshlands 86 percent of households and in hillsides 69 percent buy chemical fertilizers, a substantially higher number than non-beneficiaries (30 percent). A similar pattern can be found for purchases of pesticides: 73 percent of RSSP-supported households purchase pesticides, compared to only 32 percent of non-beneficiary households. Beneficiaries also make frequent use of certified seed. As a result of increased use of modern inputs and knowledge of improved farming techniques, RSSP-supported farmers use their land more productively than the average non-beneficiary household.

10. Furthermore, RSSP and its supported cooperatives aim to provide better market access to cooperative members and encourage the commercialization of production. This aim has been achieved. Supported rice farmers sell 74 percent of their rice harvest; in the case of maize this is 64 percent. Almost all RSSP-supported households selling part of their harvest do so primarily via the cooperatives (77–81 percent). However, interviews also suggest that finding markets for

maize and potatoes remains problematic in some cases. Farmers believed the prices offered to be low but had no alternative buyers to consider. The annual income derived from sales for RSSP marshland and hillside households was RWF 225,000–262,000, but only RWF 60,000 among the comparison group. Table 1 presents summary indicators that characterize households' crop production activities and sales.

Table 1: Key Characteristics of Crop Production

	Treatment Group: Marshland	Treatment Group: Hillside	Comparison Group
Mean amount of land (in are) cultivated in the last 12 months per HH	60.9	76.1	55.6
Mean total crop productivity (RWF per are)	9,341	8,430	5,632
Share of total crop production sold	51.0	44.3	21.4
Mean total value of sales from crop production in past 12 months	225,323	261,675	59,726

11. **Economic activity**. Almost all of the rural population—both RSSP and non-RSSP households—is engaged in the agricultural sector (either on their own or on someone else's farm). When it comes to signaling respondents' main jobs, however, there are substantial differences. In beneficiary households, more than 90 percent of both male and female working household members were engaged in agriculture in their main job. In the comparison (non-RSSP) group, higher proportions of working men find their main occupation outside the agricultural sector.

12. Very few members of RSSP-supported households have a main job working for a wage on someone else's farm, unlike those in the comparison group, for whom this is more frequently the case. Only 10–14 percent of those working mainly on the family farm supplement family farm work with agricultural wage labor elsewhere. In the comparison group, this level is much higher at 35–37 percent.

13. It seems that among RSSP-supported households, the family farm generates sufficient labor demand (and income) to keep almost all household members occupied there as a main job. Only a few household members seek additional sources of income outside the family farm.

14. **Household characteristics, education, and health.** RSSP-supported households both in hillsides and marshlands are more likely than the comparison group to use an improved source of drinking water (79–83 percent, compared to only 71 percent in the comparison group). Furthermore, 12 percent of households from RSSP-supported marshland cooperatives are connected to electricity, and 6 percent of hillside households, but only 3 percent of the comparison group. Beneficiary households are also more likely to own key household durables such as mobile phones, beds, or bicycles.

15. Qualitative findings indicate that RSSP beneficiaries felt they were better able to send their children to school. However, RSSP support has no significant effect on school attendance. This finding suggests that comparison group households are not more likely to let their children drop out of school, even if they encounter difficulties in funding. The coverage of health insurance among people supported by RSSP is higher than in non-beneficiary households. As a

result of health insurance as well as possibly better ability to afford health-related consultations, the proportion of ill persons consulting a medical practitioner is also higher in the treatment group.

16. Households headed by women are underrepresented among RSSP beneficiary households. Beneficiary households also have a lower proportion of adults who have no education or have not completed primary school. This finding can probably be explained by the better capacity of more educated households to join cooperatives, especially RSSP-supported cooperatives, as they understand the potential benefits more easily. A slightly higher level of education could also have been a pre-treatment characteristic of those cooperatives that decided to apply for RSSP support in the first place. Likewise, female-headed households might face constraints in labor capacity that makes them less willing or able to join. Without a pre-treatment baseline, no targeting analysis is possible, but the implications of these findings should be further investigated by RSSP as it moves ahead.

17. **Use of financial services**. RSSP-supported households make frequent use of established financial institutions (68% of beneficiary HHs) for saving and borrowing, and they often do so to invest in the development of their livelihoods. In contrast, comparison households rely primarily on informal sources of financial services (54% against 23% for RSSP beneficiary HHs), and they are driven to borrow mainly by the need to cover day-to-day household expenses. Majority (83%) HHs of RSSP hillside beneficiary hold a savings account, while in the comparison group only 34% HHs had an account.

18. **Wellbeing and social relations**. RSSP beneficiaries had a general impression that life had improved over recent years. Respondents pointed to several features signaling this improvement, including the ability to buy new clothes and shoes, renovate houses, own household durables and livestock, and eat different and better types of food. On nutrition in particular, some areas had previously experienced famine, and respondents felt quite strongly that they would not experience such famine again. In most cases, they credited RSSP with this rise in their standard of living as well as a greater sense of self-confidence and well-being overall.

19. The OPM study found some limited negative impacts on community relations due to the introduction of RSSP. In general the relationship between RSSP-supported cooperative members and non-members had not changed significantly. There was, however, a small element of jealousy for RSSP-supported cooperative members.

20. The general feeling was that RSSP-supported cooperative members were now much better off than non-beneficiary farmers and that their standard of living was improving faster. This is an important issue for consideration by RSSP in relation to both its ongoing activities and its future interventions. Effort should be made and planning undertaken to ensure that welfare gaps are not exacerbated.

21. **Spillover effects.** Unfortunately, the project had limited spillover effects among non-beneficiaries. Despite some goodwill among beneficiary farmers, as well as employment opportunities during the construction phase, non-beneficiaries in adjacent areas feel that little has

changed in their standard of living and that they cannot achieve results similar to those of beneficiaries unless they are targeted more actively. In agreement with these perceptions, quantitative data suggest that whatever spillover effects there might have occurred in individual cases, they were insufficient to produce measurable effects on the non-beneficiary rural population.

22. **Conclusions and recommendations**. In conclusion, RSSP 2 has been very effective in achieving its proclaimed targets. It has successfully conveyed knowledge, services, and infrastructure to the recipient cooperatives and households, thereby significantly improving the productivity and quality of life among the supported population. There is a risk that supported households could leave non-beneficiaries behind, however. Limited spillovers and the risk of increasing entry barriers contribute to this problem. This problem could exacerbate socioeconomic gaps and tensions in the community. RSSP interventions should consider this issue in relation to current and future activities.

23. The main areas identified for further consideration by RSSP and the supported cooperatives are:

- Extend post-harvest facilities to keep up with increased production.
- Further improve access to reliable and profitable markets.
  Avoid leaving non-beneficiaries behind: Encourage the transfer of knowledge, reduce entry barriers to supported cooperatives, or make key support elements accessible to farmers who are not members of RSSP-supported cooperatives.
- For RSSP 3, plan for a pre-treatment baseline study to allow for rigorous impact evaluation techniques to be applied. RSSP can be considered an excellent driving force in Rwanda's endeavors to invigorate its rural markets as well as to improve productivity and the commercialization of farming. It is hoped that this experience can be built upon and expanded even more widely in rural Rwanda in the future.

Annex 6: ICR Mission Summary - Findings from Beneficiary & Stakeholder Consultations (November/December 2012)

Objective

1. The primary purpose of the beneficiary and stakeholder consultations and stakeholder workshop was to seek and validate direct feedback from the project participants and other stakeholders related to their views of concrete results (especially outcomes) and lessons learned from RSSP 2. The OPM has carried out an extensive consultation process to provide input for the impact assessment study (late 2011/early 2012), using both qualitative and quantitative methods. The ICR mission consultation drew on relevant findings from the OPM report, checked its reliability, and validated and deepened some of the conclusions and findings. The mission used the consultation and results as inputs for drafting the ICR for RSSP 2, enhancing the implementation of RSSP 3, and developing MINAGRI's scaling-up strategy as part of its emerging PSTA 3.

2. **This Annex has three sections:**

(a) Methodological Aspects: Framework For Beneficiary and Stakeholder Consultation and Feedback During the ICR Mission.
(b) Stakeholder Consultations (Field Visits during November 29–December 1, 2012).
(c) Stakeholder Consultations (held in Kigali, on December 5, 2012).

(a) Methodological Aspects: Framework For Beneficiary and Stakeholder Consultation and Feedback During the ICR Mission

Focus Themes that Were Probed and Validated

3. The OPM impact assessment has looked into the achievement of key performance and outcome indicators and the functioning of community institutions (small groups, farmer organizations, and cooperatives). The target indicators were exceeded. Even so, greater clarification was to build on the OPM report and highlight lessons learned. During the ICR consultations, more information and probing was sought in the following key areas:

- ***The roles of various community institutions*** (such as small groups, farmer organizations, cooperatives, and so forth). The team gave particular attention to key characteristics such as their purpose, structure, process, rules and guidelines, participation, and accountability. What made some farmer groups and cooperatives function effectively and succeed, while others struggled?
- ***Inclusion and exclusion.*** The OPM report found that many farmers have not joined cooperatives owing to entry barriers such as mistrust or a poor understanding of the purpose and benefits of membership. As one of the goals of the RSSP APL is poverty reduction, it was important to probe into how the inclusion/exclusion issue might be addressed in RSSP 3. More information was sought on the relationship between gender and benefits and participation under RSSP 2. Although women were project

beneficiaries, greater insight is needed to ensure that their participation is active and effective.

- Finally, several aspects of sustainability were examined—such as the sustainability of capacity instilled through the project, financial and economic sustainability, and the project's exit strategy—in relation to ensuring that project benefits could be sustained.

Methodology

4. The stakeholder consultation workshop built on and complemented the methodology used during the OPM survey (see Appendix 1 to this Annex). The ICR mission made field visits to project sites and held focus group discussions with diverse primary beneficiaries and other local stakeholders. These discussions helped to validate and deepen findings from the OPM assessment. For each focus group discussion at the village level, the beneficiaries primarily consisted of two groups. *Group 1 consisted of members of small groups and cooperatives, including lead farmers,* who had benefited from project interventions, and beneficiaries who were not members of cooperatives. *Group 2 consisted of office bearers of cooperatives,* such as presidents, accountants, and secretaries.

5. The questions that guided group discussions were the need for and purpose of forming cooperatives, the processes followed, specific roles and responsibilities, and support received for capacity development. In addition to the beneficiary feedback and discussions, the ICR team participated in a workshop with other stakeholders from the government, private sector, and local NGOs, seeking their feedback on the key strengths and weaknesses of the project, lessons learned, and recommendations to sustain benefits and improve the implementation of RSSP 3.

(b) Stakeholder Consultations (Field Visits)[55]

6. The ICR team visited RSSP 2 sites during November 29–December 1, 2012. The teams visited the southern and eastern regions, covering a total of about 14 districts and 16 cooperatives, and visited officials from district government. The primary purpose of the field visits and community interaction was to get project participants' and beneficiaries' views on RSSP 2's concrete achievements, areas that needed more attention and improvement, and lessons that could be useful as the project's third phase moves forward.

7. For most of the workshop, participants were divided into thematic groups, based on the main activities in which they were involved and the benefits they received. Each group facilitated testimonials from all participants and established a group consensus to be presented. Some groups used the testimonials to identify average benefits across the group. This section highlights the main responses to four key guiding topics:[56] (i) project achievements, (ii) issues and problems, (iii) recommendations for improvement, and (iv) lessons learned.

[55] The SPIU and Bank team visited RSSP 2 sites in the southern and eastern regions and held discussions with local government officials as well. This annex highlights findings from stakeholders' responses to four key guide questions. The views expressed in the focus groups are considered to reflect patterns among a wider number of beneficiaries.

[56] The four guiding questions were: (1) What were RSSP's main strength/benefits? (2) What were key issues/problems in design and during implementation? (3) What were the top 3-4 improvements beneficiaries would like to do to ensure enhancement and sustainability of their benefits and also to give advice to other future beneficiary communities? (4) What were the main lessons learned—what worked well and what and what are suggestions for improvement and scaling up?

(i) **Key strengths and achievements**

a) Provided best/improved practices in agronomy, which generated significant impacts (productivity and income levels), including paradigm changes (through, for example, training, visits to other cooperatives, access to finance, and new business plans).
b) Promoted women's empowerment: Women are more confident in joining cooperatives, getting access to finance, making decisions, and leadership. Fifty percent of those elected to positions in cooperatives were women. Men expressed the equal value of women's input. The ratio of women to men in one cooperative was 2 to 1.
c) Enabled beneficiaries to move from subsistence farming to commercial farming. For example, banana producers had enhanced yields and quality and better access to markets (considering that previously many farmers did not market any or very little produce.
d) Imparted better planning skills:
   - *Many cooperatives* improved their planning skills, especially for strategic and business planning, including the motivation to meet their *own* objectives and targets. Over time, this capacity may enable district targets to be set in a more consultative manner.
   - *Lead farmers,* who trained farmers in improved agricultural practices, were motivated by the recognition from other farmers.
   - *Many farmers benefiting from the project* used their enhanced financial planning skills to support household budget decisions.
e) Enhanced marketing skills, including: selling paddy through bidding, with active support from the project (such as a "minimum" market price, storing paddy in project-financed storage facilities if prices were too low); negotiating better prices, including extensive use of cell phones; funding local service providers (through project support) to provide relevant training to beneficiary cooperatives; providing enhanced packaging methods, which brought higher market prices. A key challenge is for RSSP 3 to tap into the enhanced capacity of local service providers to help scale up capacity building for cooperatives (for example, use local service providers in new sites to train lead farmers or to provide ongoing training, assuming cooperatives have the capacity to pay them).
f) For rice cooperatives, the marshland rehabilitation schemes enabled significantly improved production and generated employment. The main source of higher yields was increased, more reliable, and efficient use of water (including the role of newly established and strengthened WUAs), because it facilitated two cropping seasons and higher yields in both. Spillover effects of marshland rehabilitation increased yields on hillside plots. Area cultivated increased significantly owing to the rehabilitated areas. The introduction of increased fish production via use of the dams, improved nutrition and cooperative revenues. The Introducion of SRI fostered increased productivity through the use of less but better quality rice seed and more productive agronomic practices.
g) Expanded post-harvest infrastructure had different effects on the marketing of increased crop production (increasing proportions of produce were bulked and sold) and enabled cooperatives to attain improved quality and prices. Many cooperatives observed that production had outstripped the available drying bays, and expressed their willingness to use their own resources to expand the drying bays. Many farmers noted that infrastructure had helped to reduce post-harvest loses (by as much as 15 percent, according to a recent post-harvest survey).

h) Strengthened cooperatives in terms of increased community inclusion, unity, and harmony, and an improved environment of caring for each other (for example, facilitating cooperative membership through lower membership payment levels, and through installments). In some cases, cooperative leaders recruit members in adjoining areas. Other examples included community-organized cooperative work (for terracing, canal maintenance, community work (*muganda*, school construction); promoting enhanced trust and unity to work together; carrying out activities on a timely basis; building assets; promoting participatory decision-making; a commitment to implement agreed decisions; and improved monitoring of decisions by the general assembly.
i) Expanded training and community-to-community exposure visits. For example, this kind of capacity development enabled several banana cooperatives to enhance marketing practices; other cooperatives learned specific crop production practices, improved the management of their cooperatives, and increased their awareness of the value of post-harvest infrastructure. Cross-visits such as a visit to Northern Province to learn about yields of 40 t per hectare of Irish potatoes generated benefits for the visiting and visited groups. The use of lead farmers to help train others, and visits to other countries also generated benefits (for example, a visit to Kenya focused on water users, and a visit to Uganda focused on rice marketing and beekeeping).
j) Promoted the adoption and benefits of mobilizing savings. Saving groups enhanced their ability to pay health insurance and school fees. Kayuma cooperative purchased a truck to enhance their marketing; several cooperatives purchased shares in a newly established rice mill. Others learned the value of savings, even small amounts. Many farmers said that they "felt good, and proud, and empowered" to deposit and withdraw money from their newly established savings accounts. Farmers organized in groups to access loans. The stakeholder discussions revealed a positive linkage between membership in a cooperative and gaining access to individual loans.
k) Enabled improved household assets. Examples include the rehabilitated of houses and purchases of motorbikes, livestock (starting with a cow), mattresses, mobile phones, house appliances, and sewing machines and other tools to operate a small business such as a shop, metal welding, or hairdressing).
l) Enhanced food security. Beneficiary farmers could have and eat rice on a regular basis, eat two meals instead of zero or one, and generally improve consumption and nutrition (including increased consumption of meat, vegetables, fish, milk, and other foods).
m) Promoted enhanced erosion control on hillsides, including the increased use of terraces on hillsides surrounding the rehabilitated marshlands; land not previously used, thereby enabling increased crop production; fodder as animal feed; compost and use of trees; a good menu of enhanced technology options, enabling increased productivity and reduced siltation of marshland canals. Erosion control brought double benefits through the expanded use of abandoned lands (through terracing) and reduced erosion control downstream.
n) Diversified activities for generating off-farm income, such as fish, rabbits, honey, goats, cows, chickens, and vegetable/kitchen gardens. Introduced new business ideas, including: household poultry enterprises, opening retail stores for rice (Ntende), women making handicrafts (through their associations). Expanded land/crop consolidation in banana, maize, Irish potatoes, beans, and wheat. And aatalyzed off-farm activities, including

establishment of small family enterprises for income diversification; examples include motor-taxis and small shops (tailoring, catering).

o) Enhanced cooperative management, financial management (use of internal auditors; firing incompetent /inefficient management; addressing corruption issues, although not common practice); management of produce (associated with improved governance/accountability of cooperatives, where members demand these improvements). There is evidence that the project has avoided "elite-capture" in the project's activities, which has been enabled through the use of various mechanisms (for example, to ensure that the distribution of marshland is equitable and transparent, based on clear selection criteria that favor landless farmers).
p) Improved linkages to financial institutions (such as savings and credit cooperatives, BPR, BK, and KCB), for cooperatives and groups of farmers rather than just individual farmers.
q) Created jobs, some temporary (through construction; also labor shortages that emerged during peak cropping seasons were alleviated through the use of community labor groups) and some permanent (through crop intensification and the recruitment of professionals to staff cooperatives).

(ii) **Key issues/problems in design or implementation**

a) Limited and insufficient post-harvest infrastructure. Production increases outstripped marketing infrastructure provided by the project;
b) Mechanization was missing in RSSP 2 and should be included in RSSP 3. For example, rice production was labor intensive, and they need to have labor-saving technologies.
c) Training that was intended to be synchronized with critical crop stages was at times delayed, thereby limiting the potential benefits (for example, training in improved fertilizer application techniques).

(iii) **Recommendations for improvement**

8. The key priorities that beneficiaries would like to highlight to ensure enhancement and sustainability of their benefits, which can also serve as advice to future beneficiary communities, included:

a) Transfer/share enhanced knowledge. Knowledge transfer would play a key role in reinforcing/ensuring sustainability of benefits. Some farmers stated: "Knowledge can be kept/expanded, and not taken away." They attributed their increased yields partly to the enhanced knowledge obtained from the project. Farmers also recognized that an integrated package of project-supported interventions generated the increased benefits.
b) Be ambitious with regard to diversifying crops and income-generating activities (on and off of the farm).
c) Encourage youth participation. Include youth in the cooperative training, since they are the "future" leaders of the cooperatives. Many older youth worked for contractors on project schemes and many were allocated irrigated marshland.
d) Promote a common vision to be shared by all cooperative members, backed by sound business plans (although most cooperatives seemed to have lacked strategic plans) and commitment to professional management and performance standards. All cooperatives

expressed the intention to strengthen and expand their cooperatives to be financially viable; all cooperatives have paid staff. Remuneration is competitive to attract and retain competent staff. Many cooperatives have fired incompetent staff/management.

e) Promote good and sustained cooperative management and governance (equivalent to "strong" leadership) and Integrate enhanced technologies in cooperative management. Cooperative members expressed satisfaction with their current leadership, while keeping high standards of performance. They have taken action if management has not been good. All cooperatives that are certified and comply with cooperative audit practices have internal and external auditors, as well as community monitoring and supervision. Members recognize the value of the audit processes and community supervision.
f) Promote continuous sensitization of farmers to the benefits of becoming a member of a cooperative and WUA, and to facilitating meeting and flexible membership requirements. Cooperative members recognized the importance of reducing entry barriers (such as large entry fees, which have been reduced in most cooperatives, and which are allowed in installments) so that there is inclusion of all members, including the poorest and most vulnerable. Small groups have also formed within each cooperative to enhance cohesiveness and inclusion. All farmers interviewed recognized the importance of WUAs and their complementarity with cooperatives;
g) Training in market development. Many farmers recognized the need to develop cooperative marketing skills to become more competitive.
h) Build and maintaining infrastructure to expand access to markets, market spaces, and processing factories (for example, buy shares in rice mills and other processing plants). Improve access roads to cooperatives to enhance marketing costs/efficiencies.
i) Diversify activities. Invest in different income-generating activities, such as a hotel (in partnership with other investors), fish farming, honey production, rabbit raising; and ecotourism, including camp grounds.
j) Ensure ability to pay cooperative staff salaries. Thus far, the project-supported cooperatives have been able to pay staff salaries (including an agronomist, accountant, manager) on a regular basis, without sustained project support. Also, farmers must be able to pay for their inputs every season, including the establishment of a fertilizer revolving fund, so as not to depend on the project.

   Cooperative members recognized the important role of securing continued support from local leaders and service agencies, such as RAB, RCA, and district officials.

(iv) Lessons Learned

9. Key lessons for scaling up include:

a) It is possible to get high yields from a small area. A small area developed with improved farming practices such as use of fertilizer, improved seed, timely weeding, and erosion control can generate higher yields than farming a large area utilizing traditional practices.
b) It is important to have an explicit strategy and criteria for allocating limited resources, in line with an overall strategy (this was reflected in the case of this project, such as the land allocation in the marshland schemes, cooperative training activities, business plans).
c) Good working relations between cooperative and local authorities lead to satisfactory and mutually beneficial results.

d) Timely changes of bad/ineffective cooperative leadership/management improve trust and participation by cooperative beneficiaries.
e) Ownership (broad-based participation and decision-making) of cooperative activities/assets by beneficiaries leads to good and quick benefits and sustainability;
f) It is important to respect/perform the calendar of planting, fertilizer application, weeding. Many farmers emphasized that "timing is everything."
g) Proper maintenance of infrastructure are critical, and one should not wait until it breaks down. Take preventive steps by training members and strengthening O&M arrangements (for example, WUA).
h) A water distribution and management plan leads to efficient use of water by marshland beneficiaries, forestalls conflicts, builds a strong cooperative, and sustains benefits.
i) Unity and good collaboration between association members (or equivalent small groups) of the cooperative help to achieve cooperative targets and foster harmonious working relations.
j) Growing one crop (monoculture) on consolidated land, or crop specialization (based on sound technical advice), adapted to an area, with adequate farming techniques (based on a menu of options), generates higher yields and enhanced marketing prospects than traditional intercropping in an unconsolidated area. This strategy has evolved over time. It is easier to achieve in marshland areas than hillsides, due to land ownership and provision of a common good.[57]
k) It is important to work with banks to get sustained access to finance.

(v) Stakeholder Consultations

10. In addition to the workshop and beneficiary feedback, the ICR mission also participated in stakeholder consultations in Kigali on December 5, 2012. [58] Participants came from the government, private sector, and local NGOs. Feedback was sought on key strengths and weaknesses of the project, lessons learned, and recommendations to sustain benefits and improve implementation of RSSP 3. From the perspective of these key stakeholders, the main strengths, weaknesses, and lessons learned are summarized in the sections that follow.

(vi) **Key strengths/benefits of the project**

a) Capacity building of participating local service providers and NGOs was beneficial in that they used those skills to impart various kinds of training to beneficiary cooperatives and farmers, including enabling the Board of Directors of cooperatives to be more effective.

[57] RSSP 2 sponsored a land consolidation study that helped underpin this production and intensification strategy, in line with PSTA 2 strategies being promoted at the national level. In the initial years of RSSP 2, it appeared that the government had mandated certain crops, but MINAGRI's strategy is evolving (as seen in the unfolding PSTA 3) to encourage farmers to make their own crop choices, based on agroclimatic and market considerations and advice provided by extension workers and lead farmers.

[58] A stakeholder consultation workshop was organized by the SPIU, inviting "representative" stakeholders from beneficiary farmer cooperatives, local service providers for RSSP 2, collaborating central government ministries/agencies (including the Ministry of Finance and Planning, MINAGRI/RBA, Rwanda Cooperative Agency, Ministry of Trade, private sector (participating banks, rice millers). The main methodology followed was focus group discussion, in two parallel groups, with mixed composition, based on the same four guide questions. Many responses followed consistent patterns found during the field visits highlighted above.

b) Farmers trained by these NGOs and local service providers dramatically changed their mindsets and now have a much stronger market orientation. These farmers increased their knowledge and skills in agricultural technology practices, and cooperatives increased their knowledge and skills in business practices, plans, and farmer organization.
c) Land consolidation and crop specialization have increased farmers' incomes from agriculture and expansion of area under cultivation through the marshland irrigation schemes generated substantial benefits to beneficiary farmers and cooperatives.
d) The project fostered strong cooperatives, which played a key role in providing improved livelihoods to members.
e) The project enabled adoption of improved agricultural techniques and post-harvest management.
f) RSSP 2-initiated WUAs have become successful and effective in ensuring adequate O&M of marshland irrigation schemes.
g) The project contributed to poverty reduction, as reflected by measurable indicators.
h) Farmers gained greater access to financial products (beneficiaries accessed the RIF, a separate source of funds for rural investments). The project linked farmers to local banks, which perceived farmers as having lower risks than they had thought ("farmers got closer to local banks"). And the project created trust between farmers and financial institutions in that the institutions were comfortable to finance agriculture.
i) Temporary and permanent employment was created (for example, temporary work in the construction/rehabilitation stage and permanent jobs through project-induced crop intensification).
j) Contractors gained experience in marshland development, which is being scaled up in other parts of Rwanda and dependence on international companies to carry out construction was reduced through the project.
k) The project fostered development of small and medium enterprises (SMEs), increased competition among contractors, and increased turnover/revenues for participating contractors (enabling them to expand their operations in Rwanda).

(vii) **Key issues/problems in design or implementation observed during implementation**

a) Initially there were some challenges in convincing farmers of the benefits of growing paddy rice; as farmers saw the benefits from rice-growing farmers, they became convinced.
b) Generally the biggest implementation challenge is that some contractors don't respect the time-frame in the contract (although this problem was overcome toward the last year of implementation). And variation in prices for construction materials was another challenge.

(viii) **Top recommendations** that participants would like to make to ensure that benefits are enhanced and sustained and that can serve as advice to future beneficiary communities:

a) RCA has decentralized to the district level to support continued strengthening of the beneficiary and non-beneficiary cooperatives. There was a consensus that it can take an average of three years of capacity building and technical support (from RCA) to ensure that cooperatives become sustainable entities, capable of managing and diversifying viable enterprises.

b) The Ministry of Natural Resources should set up a catchment committee (covering the whole watershed).
c) Issue water permits under which all water users pay the agreed rate to sustain the irrigation schemes.
d) Recommend using the National Agricultural Export Development Board program to protect and monitor planted fruit trees and agro-forestry trees to ensure hillside protection.
e) Empowerment of men and women through capacity building should continue.
f) The WUAs that have been established will ensure sustainability of infrastructure.
g) Investment and diversification of commodity and non-farm activities.

(ix) **Lessons Learned**: Why did project activities/practices work well? What are suggestions for improvement and scaling up?

a) Hillside protection should be done comprehensively (consider the whole watershed) and agroforestry trees planted on hillsides should be monitored until maturity.
b) Good selection of crops, especially vegetables (choosing spices over bulky vegetables).
c) Contract farming in vegetables would work well.
d) Selection of good seeds leads to better quality and quantity of paddy.
e) Introduction of WUAs is an effective instrument for sustaining the operation and maintenance of irrigation infrastructure.

Appendix 1

RSSP-2 – Performance Indicators: Update and Impact Assessment Vol. 2
Overview of the Methodology for the Impact Assessment: Qualitative Assessment [59]

1. **Overview.** The Impact Assessment carried out by the OPM team used a mixed-methods approach combining qualitative and quantitative research techniques to assess impact and trace it to the RSSP project. Extensive Focus Group Discussions with beneficiaries and non-beneficiaries were held to analyze recipients' perceptions of the project as well as its impact. Furthermore, key informant interviews were held to support findings from local government officials, cooperative management, and RSSP and MINAGRI staff.

2. Findings from the qualitative research are supported by estimates from a quantitative survey undertaken among 1,300 RSSP-supported households. The survey provides a representative picture of the situation among marshland and hillside households. In addition, this report contains analysis of selected households from the EICV3 data, which serve as a comparison group for the estimates obtained for RSSP-supported households and places the findings into the context of rural Rwanda. It is important to note that without a pre-treatment baseline (as well as the fact that RSSP selected the cooperatives for support based partly on systematic criteria, which this Impact Assessment is unable to replicate among any comparison group), differences between quantitative estimates cannot be rigorously defined as the "impact" of the project. Instead, the quantitative analysis establishes a robust situation analysis for both RSSP beneficiaries and non- RSSP beneficiaries and comparison of the two provides further support for the evidence found through qualitative research. It is only through this mixed-methods approach that impact can be attributed.

[59] Extract/synthesis taken from RSSP2 Performance Indicators Update and Impact Assessment – Volume 2. © Oxford Policy Management (February, 2012).

Annex 7: Summary of the Government of Rwanda's ICR and Comments on Draft ICR

1. In a letter from the Minister of Agriculture and Animal Resources to the Rwanda Country Manager, dated April 12, 2013, the Minister writes:

"We are in agreement with the findings and ratings of the Implementation Completion and Results report for Rwanda Second Sector Support Project (RSSP II) and appreciate the support rendered to the Ministry and the Rwandan people through the project.

RSSP II has tremendously changed farmers' socioeconomic life in a short period of time and contributed to; the country's GDP, food security, increased farmers income, reduced poverty and enabled farmers to save for the future to mention but a few achievements.

A trip to the country side where the project is implemented tells its story not only because of the transformed marshes and dams dotting the countryside, but also the emerging trading centers and processing facilities. The Ministry believes that the successes and challenges of RSSP II have informed the design of RSSP III in a manner that will lead to more poverty reduction and even better incomes for farmers going forward.

I take this opportunity to thank the World Bank for its commitment to the people of Rwanda and to thank your office in particular for the good working relationship and strong support given to the project and to the Ministry of Agriculture and Animal Resources."

Summary of GoR's ICR

2. **Executive Summary**[60] (from ICR of November 2012). The Rural Sector Support Project (RSSP) is currently in phase two, with the overarching goal of accelerating the pace of intensification and commercialization of agricultural production. The project is funded by an International Development Association (IDA) grant in the amount of US$35 million, plus a government counterpart contribution of US$ 2 million. The PDO is to increase agricultural production and marketing in marshland and hillside areas targeted for development under the project in an environmentally sustainable. RSSP 2 was planned to run from October 22, 2008 to October 31, 2012 and has three components: (i) Marshlands and Hillsides Rehabilitation and Development, (ii) Strengthening Commodity Chains, and (iii) Project Coordination and Support. The implementation of the project activities has progressed very well, as presented in the table below.

[60] For further details, see the complete ICR prepared by the Government of Rwanda (dated November 2011). The government intends to update their ICR, although it is not foreseen that much of the content will be revised since the project essentially completed its activities by the end of 2012. The Bank's ICR was prepared in close collaboration with the SPIU team, hence reflects an updated assessment, with valuable inputs provided by the SPIU team.

Table 1: Project Achievements Component 1 and 2 Indicators

Intermediate Outcome Indicators	Project achievements 31 Dec. 2011
Component 1: Marshland and Hillside Rehabilitation and Development	
By the end of the project, at least 3,300 additional ha of irrigated marshlands have been rehabilitated or developed by the project (EDPRS/PSTA indicator)	By December 2011, 3,324 ha of marshland have been rehabilitated or developed (100.7%)
By the end of the project, at least 75 percent of the farmers in irrigated marshlands rehabilitated or developed by the project (RSSP 1 and RSSP 2) are paying water charges through WUAs	79%of farmers are paying water charges and WUAs are established in all the marshlands
By the end of the project, at least 9,900 additional ha of hillsides have been sustainably developed by the Project (EDPRS/PSTA indicator)	10,096 ha completed 102% have sustainably developed..
Component 2: Strengthening Commodity Chains	
By the end of the project, at least 80 cooperatives supported by the project have quality business plans under implementation	81 cooperatives have developed their business plans
By the end of the project, at least 5 additional cooperatives supported by RSSP 2 are marketing certified maize and potato seed	15additional cooperatives are marketing certified maize and Irish potatoes seeds
By the end of the project, with at least 75 percent of the rural infrastructure subprojects funded through the LDF, the majority of users are satisfied one year after the subproject was completed	To be determined by the Impact Assessment Study

3. Because of the good progress of the project implementation program activities and early attainment of the project objectives, the government and donors have agreed to advance the closure of the project. RSSP 3 is planned to start next year and will build on the RSSP 2 project achievements and foundation.

Annex 8: Key Supporting Documents

A) From World Bank:

1. OPCS, Guidelines for Implementation Completion and Results Report (August 2006, Updated, 10/05/11)
2. IEG, Implementation Completion Report: An Overview Presentation (orientation workshop, 2012)
3. *Agriculture for Development*, 2008 World Development Report. Washington, DC: World Bank. 2007
4. RSSP 1 Project Implementation and Completion Report (December 22, 2008)
5. RSSP 2: Project Concept Note (June 2007)
6. RSSP 2: Project Appraisal Document, Second RSSP (June 2, 2008)
7. RSSP 2: Development Grant Agreement (July 2008)
8. RSSP 2 Implementation Status Reports (from 2008 to 2012)
9. RSSP 2 Mission Aide Memoires (from 2008 to 2012)
10. RSSP 2 Aide Memoire for Mid-Term Review and Implementation Support Mission (October 2010)
11. RSSP 2 ICR: The EFA model in Excel format **without** @Risk formulas (RSSP 3-related). Includes several cases for RSSP 2 and RSSP 3 analyses. Note the Cover Page instruction on how to use the model.
12. RSSP 2 ICR: The EFA model in Excel format **with** @Risk formulas (RSSP 3-related). Includes several cases for RSSP 2 and RSSP 3 analyses. Note the Cover Page instruction on how to use the model.
13. RSSP 2: Technical Document to Aide Memoire. Mid-Term Review and Implementation Support Mission for Rwanda's Second Rural Sector Support Project (RSSP 2). 4-15 October 2010. World Bank, Washington, DC.
14. RSSP 2 and 3: Aide Memoire. Rural Sector Support Program (RSSP). RSSP 2 Implementation Support Mission. RSSP 3 Preparation Mission. 25 July–5 August 2011. World Bank, Washington, DC.
15. RSSP 3: Aide Memoire. Rural Sector Support Program (RSSP). RSSP 3 Appraisal Mission. 28 November – 9 December 2011. World Bank, Washington, DC.
16. LWH: Project Appraisal Document for the Rwanda Land Husbandry, Water Harvesting and Hillside Irrigation Project. Report No: 50901-RW (2009). World Bank, Washington, DC.
17. BioCarbon Fund Experience: Insights from Afforestation and Reforestation Clean Development Mechanism Projects. Report from World Bank Carbon Finance Unit, Washington, DC. December 2011.
18. Carbon Sequestration in Agricultural Soils. Economic and Sector Work Report No. 67395-GLB. World Bank, Washington, DC.

B) From the Government of Rwanda/RSSP 2 Project Unit (which were carried out by independent consultants/teams):

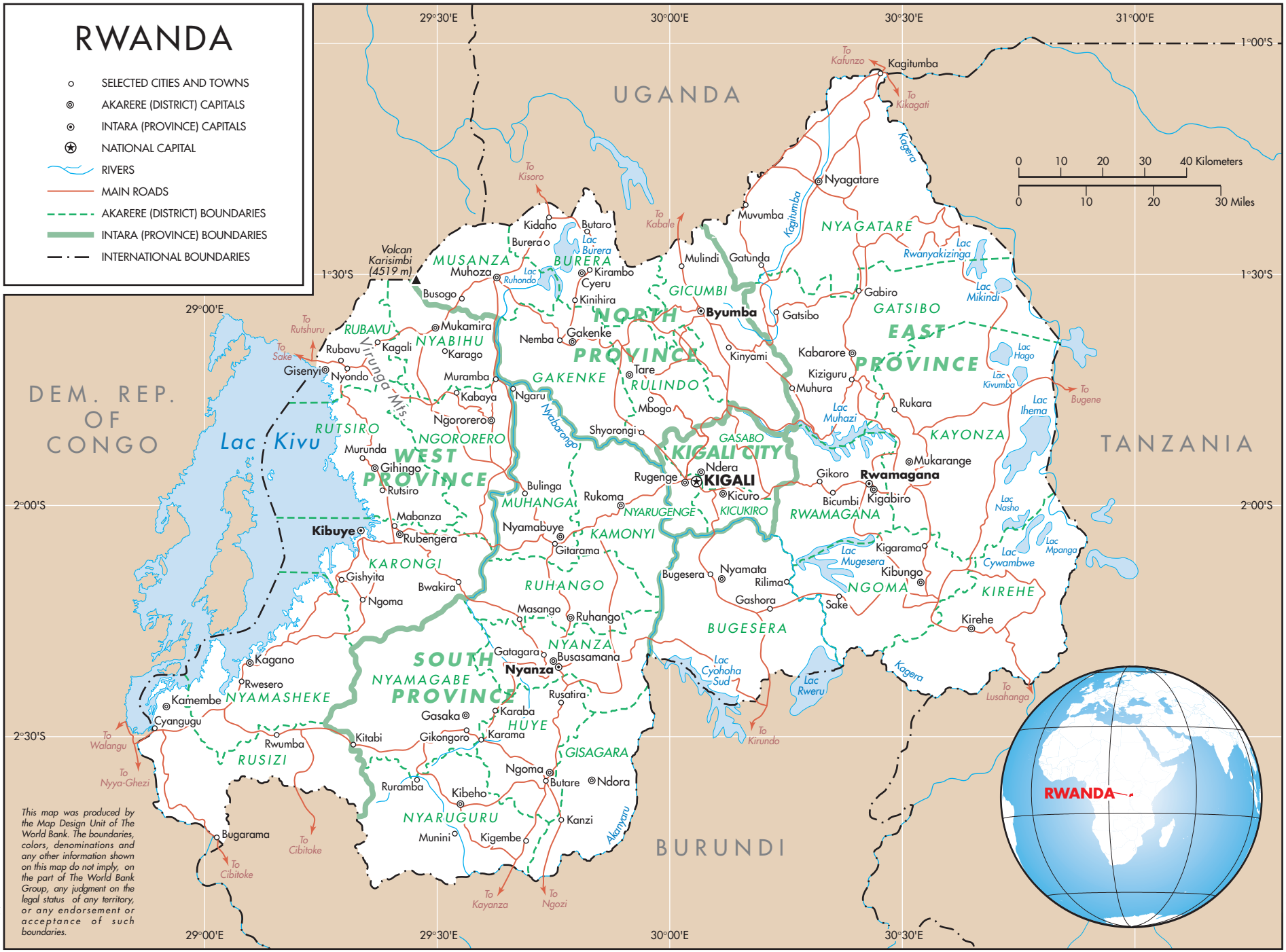
1. RSSP 2 Project Preparation Documents: (mostly prepared in 2007/08)
   (i) Irrigated Marshlands Development Strategy
   (ii) Rainfed Hillsides Development Strategy

(iii) Sustainable Agricultural Intensification Strategy
(iv) Capacity Strengthening Strategy
(v) Environmental Assessment and Environmental Management Plans
(vi) Environmental and Social Management Framework
(vii) Pest Management Plan
(viii) Resettlement Policy Framework
(ix) Resettlement Action Plans
(x) Design of the Rural Investment Facility (RIF)

2. RSSP 2: Project Implementation Manual (June 2008), prepared by the PSCU
3. Soil Testing and Fertilizer Recommendation for various marshlands by Crop Nutrition Kenya (2010)
4. Hydrology and Biodiversity for Gisaya, Kinnyogo, Kibaya, and Cyunuzi marshlands by Sher Ingénieur Conseil (2009)
5. RSSP 2: Implementation Completion Report (December 2011)
6. Stryker, J.D. Rwanda Rice Commodity Chain: Strategic Options to Maximize Growth and Poverty Reduction. Final Report. Rural Sector Support Project II (RSSP II). Republic of Rwanda, Ministry of Agriculture and Animal Resources. August (2010)
7. RSSP 2 Performance Indicators: Update and Impact Assessment (prepared by the Oxford Policy Management (UK, February 2012)
   (i) Volume 1: Performance Indicators Update
   (ii) Volume 2: Impact Assessment

C) Other Relevant Documents: (including independent assessments)

1. Belli, P., J. R. Anderson, H.N. Barnum, J.A. Dixon, and J.-P. Tan (1998). *Handbook on Economic Analysis of Investment Operations.* Operational Core Services Network Learning and Leadership Center. Washington, DC: World Bank.
2. Falloon P, P. Smith, R. Betts, C.D. Jones, J. Smith, D. Hemming, and A. Challinor (2009). "Carbon Sequestration and Greenhouse Gas Fluxes from Cropland Soils – Climate Opportunities and Threats." Chapter 5 in *Climate Change and Crops*, edited by S.N. Singh. DEU: Springer, Berlin/Heidelberg. Pp. 81-111.
3. Fankhauser, S. (1995). *Valuing Climate Change: The Economics of the Greenhouse*. London: Earthscan.
4. Inocencio, A., M. Kikuchi, M. Tonosaki, A. Maruyama, D. Merrey, H. Sally, and I. de Jong (2005). "Costs and Performance of Irrigation Projects: A Comparison of Sub-Saharan Africa and Other Developing Regions." International Water Management Institute (IWMI). Research Report 109. Colombo.


RWANDA
SELECTED CITIES AND TOWNS
AKARERE (DISTRICT) CAPITALS
INTARA (PROVINCE) CAPITALS
NATIONAL CAPITAL
RIVERS
MAIN ROADS
AKARERE (DISTRICT) BOUNDARIES
INTARA (PROVINCE) BOUNDARIES
INTERNATIONAL BOUNDARIES
UGANDA
DEM. REP. OF CONGO
TANZANIA
BURUNDI
Lac Kivu
Volcan Karisimbi (4519 m)
Virunga Mts
Kigali
Byumba
Kibuye
Nyanza
Rwamagana
Kagitumba
Nyagatare
Muvumba
Mulindi
Gatunda
Gabiro
Gatsibo
Kinyami
Kabarore
Kiziguru
Muhura
Rukara
Mukarange
Gikoro
Bicumbi
Kigabiro
Kigarama
Kibungo
Kirehe
Nyamata
Rilima
Gashora
Sake
Bugesera
Rugenge
Ndera
Kicuro
Rukoma
Shyorongi
Mbogo
Tare
Rulindo
Nemba
Gakenke
Kinihira
Cyeru
Kirambo
Butaro
Kidaho
Burera
Muhoza
Busogo
Mukamira
Karago
Muramba
Kabaya
Ngororero
Ngaru
Bulinga
Nyamabuye
Gitarama
Masango
Ruhango
Gatagara
Busasamana
Rusatira
Karaba
Karama
Gikongoro
Gasaka
Kitabi
Rwumba
Cyangugu
Kamembe
Rwesero
Kagano
Bugarama
Ruramba
Kibeho
Munini
Kigembe
Kanzi
Butare
Ndora
Ngoma
Bwakira
Gishyita
Ngoma
Mabanza
Rubengera
Murunda
Gihingo
Rutsiro
Rubavu
Kagali
Nyondo
Gisenyi
Lac Ruhondo
Lac Burera
Lac Rwanyakizinga
Lac Mikindi
Lac Hago
Lac Kivumba
Lac Ihema
Lac Muhazi
Lac Nasho
Lac Mpanga
Lac Cywambwe
Lac Mugesera
Lac Cyohoha Sud
Lac Rweru
Kagera
Kagitumba
Akanyaru
Nyabarongo
To Kafunzo
To Kikagati
To Kisoro
To Kabale
To Rutshuru
To Sake
To Bugene
To Lusahanga
To Kirundo
To Walangu
To Nyya-Ghezi
To Cibitoke
To Kayanza
To Ngozi
NORTH PROVINCE
EAST PROVINCE
WEST PROVINCE
SOUTH PROVINCE
MUSANZA
BUREERA
GICUMBI
NYAGATARE
GATSIBO
RUBAVU
NYABIHU
GAKENKE
RULINDO
GASABO
KIGALI CITY
KAYONZA
RUTSIRO
NGORORERO
MUHANGA
NYARUGENGE
KICUKIRO
RWAMAGANA
KAMONYI
KARONGI
RUHANGO
NGOMA
KIREHE
BUGESERA
NYANZA
NYAMAGABE
NYAMASHEKE
HUYE
GISAGARA
RUSIZI
NYARUGURU
1°00'S
1°30'S
2°00'S
2°30'S
29°00'E
29°30'E
30°00'E
30°30'E
31°00'E
0 10 20 30 40 Kilometers
0 10 20 30 Miles
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