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Report No: ICR00004539

IMPLEMENTATION COMPLETION AND RESULTS REPORT

IDA-46740 AND IDA-53290

ON A

CREDIT

IN THE AMOUNT OF SDR 49.04 MILLION
(US\$ 69.00 MILLION EQUIVALENT)

AND

TF-10953, TF-11435 AND TF-99108

GRANT

IN THE AMOUNT OF SDR 99.55 MILLION
(US\$ 71.06 MILLION EQUIVALENT)

TO THE

REPUBLIC OF RWANDA

FOR A

LAND HUSBANDRY, WATER HARVESTING AND HILLSIDE IRRIGATION PROJECT
(P114931)

DECEMBER 17 , 2018

CURRENCY EQUIVALENTS

(Exchange Rate Effective June 30, 2018)

Currency Unit =

RCA

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DATA SHEET

BASIC INFORMATION

Product Information

| | |
|------------------------|--|
| Project ID | Project Name |
| P114931 | Land Husbandry, Water Harvesting and Hillside Irrigation |
| Country | Financing Instrument |
| Rwanda | Investment Project Financing |
| Original EA Category | Revised EA Category |
| Partial Assessment (B) | Partial Assessment (B) |

Related Projects



RESTRUCTURING AND/OR ADDITIONAL FINANCING

| Date(s) | Amount Disbursed (US\$M) | Key Revisions |
|-------------|--------------------------|---|
| 08-Nov-2013 | 19.65 | Change in Results Framework Reallocation between Disbursement Categories |



| | | | | |
|----|-------------|--------------|--------------|-------|
| 12 | 28-Sep-2016 | Satisfactory | Satisfactory | 58.98 |
| 13 | 13-Apr-2017 | Satisfactory | Satisfactory | 66.42 |
| 14 | 22-Oct-2017 | Satisfactory | | |



Environment and Natural Resource Management

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I.



Project Development Objectives (PDOs)

9. As stated in the Financing Agreement (FA) and in line with the PAD, the development objective of the project was to increase the productivity and commercialization of hillside agriculture in target areas in Rwanda's territory.

Key Expected Outcomes and Outcome Indicators

10. Project performance was assessed against two outcomes, measured by three outcome indicators:

Objective 1: Increase productivity of hillside agriculture in target areas, measured by two indicators, namely productivity of targeted irrigated command area (dollars/ha), and productivity of targeted non-irrigated hillsides (dollars/ha). Both productivity indicators are showing the change in the value of crop production per unit of land, while differentiating between irrigated and rainfed project areas;

Objective 2: Increase commercialization of hillside agriculture in target areas, measured by the share of commercialized crops from target areas (percentage) in the total crop production.

11. Expressed in economic terms, these indicators allowed comparison and aggregation across diverse multi-crop production and marketing systems, as well as the factoring in of any changes in crop production and marketing patterns during project implementation. All three indicators were measured using periodic surveys and cooperative reports, while also drawing on the MINAGRI's market information system (for local prices).

Components

12. Component A - Capacity Development and Institutional Strengthening for Hillside Intensification (Appraisal: US\$ 12.12 million; closing: US\$ 19.47 million⁴): Component A aimed at developing the capacity of individuals and

⁴ Exclusive of Government contribution



institutions for improved hillside land husbandry, stronger agricultural value chains and expanded access to finance. Overall, it financed the "soft" investments of the Project. It had four sub-components, namely: A1 Strengthening Farmer Organizations; A2 Extension; A3 Marketin

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resources, which helped expand the geographic scope of Project activities, justified the first two extensions, while



use of improved seeds and composting), as well as increases in farmers' capacity and knowledge. Sediment load



after 2011, to reach nearly US\$ 1,000,000 cumulatively by Project closing. These savings enabled beneficiaries to leverage additional resources through loans from the financial institutions partnering with the Project.

Poverty Reduction and Shared Prosperity

54. With the Project targeting subsistence smallholders, it contributed directly to the World Bank's twin goals of ending extreme poverty and boosting shared prosperity in a sustainable manner. The DIME evaluation revealed the positive impact that the Project had on beneficiaries' incomes, as the treatment households had consistently higher incomes than comparison households. At the same time, the Project proved important in curtailing food insecurity amongst its beneficiaries. The same evaluation also showed that the Project households generally had lower propensity of severe or moderate food insecurity than their non-beneficiary counterparts.

Other Unintended Outcomes and Impacts

55. Composting, as a business: While it was originally needed in many LWH sites to help increase soil organic matter and, thereby, recover soil fertility and improve soil water holding capacity, composting also proved to be a lucrative business. The Project compost making module also included training of entrepreneurs who were interested in making this a business. As a result, composting generated important off-farm income mainly for the unemployed youth and/or landless members of the community. For instance, at the close of Season B 2017, 205 farmer groups collected a total income of RWF 224,670,896 (equivalent of about US\$ 260,000) for 9,832 tons of compost sold to the Project or neighborhood farmers.

56. Catalyzing private investment: The irrigation and post-harvest infrastructure that the Project developed was key for attracting agribusiness partners in the Project areas. Irrigation paved the way for growing higher value crops, and for reducing exposure to weather and climate risks; consolidation of farmed land, in this context, also created the premise for more efficiency. Post-harvest infrastructure, together with the development of farmers' organizations, helped aggregate produce and improve its quality. The horticulture packhouse (see paragraph



well-articulated together. The strong emphasis on a market-driven approach, anchored in value chain and market potential studies, was essential for the effective targeting of the future Project activities.

59. Background studies and lessons learned: The Project successfully incorporated lessons learned from international experience and previous operations in Rwanda. Specifically, regarding watershed management, the Project design recognized and reflected the importance of multidisciplinary teams and

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97. Early and wide community involvement: The Government's hillside intensification objectives could not have been successfully achieved without the strong ownership and engagement of farmers in production and marketing activities. Both Project design and implementation recognized this and spent important resources to ensure that beneficiaries were sensitized, mobilized, consulted, advised and trained, as appropriate. Consequently, beneficiaries became fully invested in the Project activities and achieving results; moreover, several turned into drivers of change, by sharing their positive experience and acquired knowledge. Reliance on training of trainers and farmer-led knowledge sharing laid the foundation for the Project's success and for the national scale-up of agriculture extension and training services.

98.



ANNEX 1. RESULTS FRAMEWORK AND KEY OUTPUTS

A. RESULTS INDICATORS

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which have increased their net revenues by 50% relative to the baseline



| Indicator Name | Unit of Measure | Baseline | Original Target | Formally Revised Target | Actual Achieved at Completion |
|---|-----------------|----------|-----------------|-------------------------|-------------------------------|
| Male adult population in project areas using services of formal financial | | | | | |



| | |
|---|--|
| | <p>5. 4 new financial products developed (farm production credit, harvest credit, value chain production credit, value chain agro-dealer credit)</p> <p>6. 54,783 Kitchen gardens established</p> <p><u>Component B:</u></p> <p>7. 7 WUAs set up, with 8,671 members (48 percent women)</p> <p>8. 859 WUA members trained in WUA management and irrigation</p> <p>9. Radical terraces developed on 18,383 ha</p> <p>10. Other soil conservation measures applied on another 3,265 ha</p> <p>11. 58,855 farmers (44.4 percent women), 276 district and sector technicians, 113 professionals from MINAGRI, MINERENA, REMA and RAB staff trained on land husbandry technologies</p> <p>12. 2,270 lead farmers (43.2 percent women) trained on management and maintenance of land husbandry infrastructures</p> |
| Objective/Outcome 2: Increase commercialization of hillside agriculture in target areas | |
| Outcome Indicators | <p>1. Share of commercialized crops from target areas (percentage) in the total crop production</p> |
| Intermediate Results Indicators | <p>1. Number of cooperatives which have increased their net revenues by 50 percent relative to the baseline</p> <p>2. Cooperatives and their Self Help Groups (SHG) ranked and graded high (A and B)</p> <p>3. Percentage of households with acceptable food consumption</p> <p>4. (Male/female) adult population in pr 2.</p> |



ANNEX 2. BANK LENDING AND IMPLEMENTATION SUPPORT/SUPERVISION

A. TASK TEAM MEMBERS

| Name | Role |
|---------------------|-------------------------|
| Preparation | |
| Lorraine Ronchi | Task Team Leader |
| Christine Cornelius | Program Coordinator |
| Alassane Sow | Lead operations Officer |



| | |
|--|--|
| Marie-Claudine Fundi | Language Program Assistant |
| Supervision/ICR | |
| Winston Dawes, Aimee Marie Ange Mpambara | Task Team Leader(s) |
| Mulugeta Dinka | Procurement Specialist(s) |
| Enagnon Ernest Eric Adda | Financial Management Specialist |
| Mohammad Imtiaz Akhtar Alvi | Team Member (Farmers' Organizations and Rural Finance) |
| Belinda Mutesi | Team Member (Program Assistant) |
| Tizikara Clesensio | Team Member (M&E Specialist) |
| Hayalsew Yilma | Team Member (Irrigation Specialist) |



| | | |
|------|--------|-----------|
| FY10 | 11.350 | 75,762.34 |
| FY11 | 40.376 | |





ANNEX 4. EFFICIENCY ANALYSIS

1. This annex assesses the efficiency of the Project, by providing an ex-post economic and financial analysis (EFA) of related investments for 69,363 direct beneficiary households on 18,000 hectares of hillside areas, across 13 districts. By using the data on project outputs and outcomes, the EFA aims to determine whether the costs involved in achieving the project were reasonable in comparison with the benefits.³⁰ The analysis also looks at whether there is significant deviation from the original analysis, whether benefits are equitable, for on-farm and off-farm investments of the project, while considering changes to the project during implementation. The analysis benefited from the DIME reports, M&E reports, field visits and SPIU data.

2. Pre-investment. The EFA at appraisal assessed the economic and financial aspects of all project activities bundled together, without distinguishing between the specific effects of each component activities. It focused on defining the expected key benefits, as follows: (i) on-



Components/Sub-Components

USD (million)



increasing the cropping intensity, while perennial tree crops and vegetables have increased the shift towards higher-value crops.

9. While the EFA at appraisal did not specifically analyze activities under component A - related to training and capacity building, farmer organisations and related water user associations (WUA) - such



the agricultural season to include Season C. The analysis used parameters based on information from the SPIU and national statistics, as follows:

15. Crop Models. The financial analysis, for a small selection, of crop models included in the farm models are as follows:

Maize. A staple crop widely grown on rainfed, hillside areas of Rwanda, benefited greatly from terracing that led to significant improvements in yield, from 1.5 tons to 2.8 tons per hectare, during the years 2014 to 2017. The average yield figures are from the SPIU's M&E system. The analysis of maize per hectare finds that the FIRR is 22%, NPV is USD 285, the BCR is 1.38, and switching values are -28 percent for benefits and 38 percent for costs, discounted over a 20-year period.

Climbing beans. The commercial nature of this crop as both a nutritious supplement to family far diets and a cash crop makes it a common feature. The FIRR is 45 percent, NPV is USD 493, the BCR is 1.20, and switching values are -17 percent for benefits and 20 percent for costs.

Potato. The SPIU suggested that through terracing, potato experienced one of the highest increases in yields, from an average of 2 tons to 20 tons per hectare. While this figure changes invariably, the analysis used the baseline figure of 3 tons per hectare and 17 tons per hectare from the M&E tables. With this, the analysis found that for potato the FIRR is incalculable, NPV is in excess of USD 20,000, the BCR is 2.17, and switching values are -54 percent for benefits and 117 percent for costs. While the use of conservative figures in the FAO stat are possible as a baseline, the analysis attempts to remain consistent with the use of source data by referring to the baseline figures of 2009 and the M&E data gathered by the SPI-4(rp/P AMCID 31-BDC BT1 0 0 1 29(317(fo)-4



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ANNEX 5. BORROWER, CO-FINANCIER AND OTHER PARTNER/STAKEHOLDER COMMENTS

We thank the World Bank team for the excellent ICR, which generally reflects our own perceptions of the project implementation. We want also to take this opportunity to thank the World Bank task team for the inestimable technical support from the time of LWH design, during implementation and at closing. The very good results of the Project are also to a significant extent fruits of the very good collaboration



ANNEX 6.



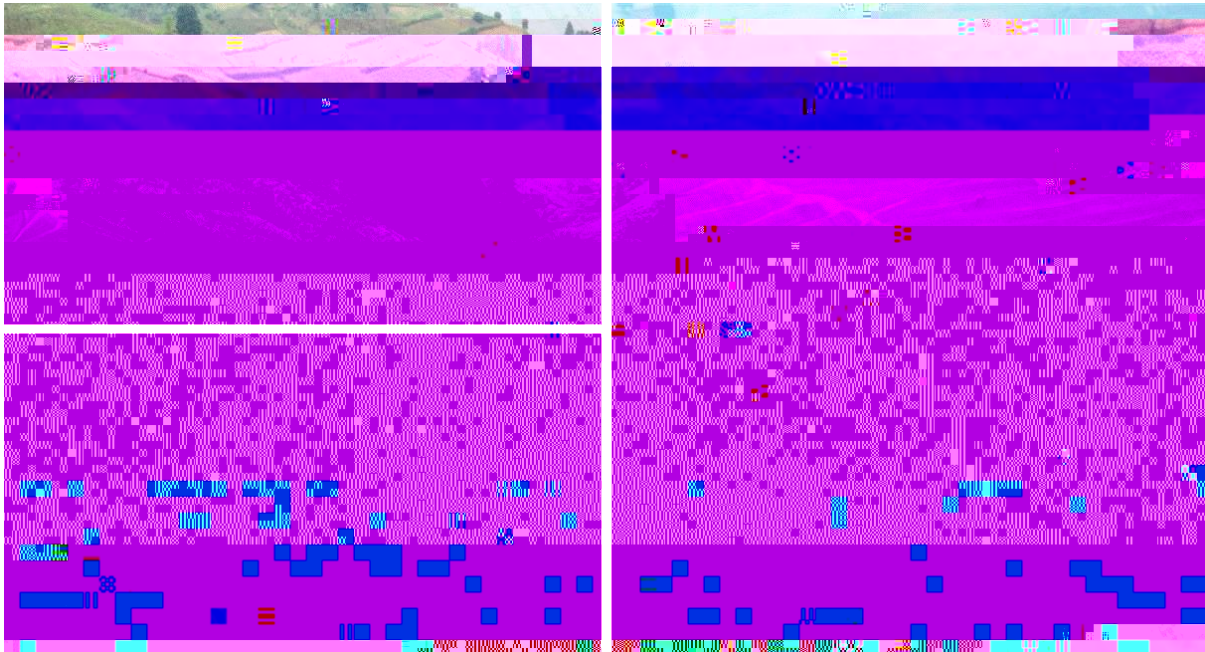
"

Like many other farmers at the Gicumbi site, Mr. Theoneste Uwimana, a



ANNEX 7. THE PROJECT IN PICTURES³⁴

1: Land husbandry – before, during and after radical terracing



2: Compost making



³⁴ Courtesy of SPIU



5: Kitchen gardens



6: Water harvesting infrastructure





7: The Muyanza model village houses with water, electricity, waste management and improved roads³⁵



³⁵ Built for some of the PAHs



ANNEX 8. SUPPORTING DOCUMENTS

1. Country Assistance Strategy for the Republic of Rwanda for FY09-12, IDA, IFC, MIGA, August 7, 2008.
2. Country Partnership Strategy for the Republic of Rwanda for the Period FY14-18, IDA, IFC, MIGA, May 1, 2014.
3. Implementation Completion Report for the Land Husbandry, Water Harvesting and Hillside Irrigation (LWH) Project, Final Report, MINAGRI, June 2018.
4. Land Husbandry, Water Harvesting and Hillside Irrigation Project, Impact Evaluation Endline Report, World Bank, 2015.