

# PROJECT PERFORMANCE ASSESSMENT REPORT

RWANDA

# Transformation of Agriculture Sector Program Phase 3 Program-for-Results

Report No. 177336  
JANUARY 11, 2023



**IEG**  
INDEPENDENT  
EVALUATION GROUP

**WORLD BANK GROUP**  
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**Attribution—Please cite the work as follows:**

World Bank. 2023. Rwanda—Transformation of Agriculture Sector Program Phase 2 Program-for-Results.  
Independent Evaluation Group, Project Performance Assessment Report 177336, Washington, DC: World Bank.

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**Report No.: 177336**

**PROJECT PERFORMANCE ASSESSMENT REPORT**

**Rwanda**

**Transformation of Agriculture Sector Program Phase 3  
Program-for-Results  
(IDA-55480, IDA-59620, TF-19208, TF-A6465)**

January 11, 2023

Finance, Private Sector, Infrastructure and Sustainable Development

*Independent Evaluation Group*

## Abbreviations

DLI	disbursement-linked indicator
FY	fiscal year
IDA	International Development Association
IEG	Independent Evaluation Group
KPI	key performance indicator
LWH	Land Husbandry, Water Harvesting and Hillside Irrigation Project
PAP	Program Action Plan
PDO	program development objective
PforR	Program-for-Results
PPAR	Project Performance Assessment Report
PSTA	Transformation of Agriculture Sector Program
RSSP	Rural Sector Support Project
SACCO	savings and credit cooperative
TOC	theory of change

*All dollar amounts are US dollars unless otherwise indicated.*

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*Note: IEG = Independent Evaluation Group; PPAR = Project Performance Assessment Report.*

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## Data

This is a Project Performance Assessment Report by the Independent Evaluation Group of the World Bank Group on the Rwanda Transformation of Agriculture Sector Program Phase 3 Program-for-Results, P148927.

**Methodology.** This Project Performance Assessment Report instrument and the methodology for this evaluation are discussed in appendix C.

Following standard Independent Evaluation Group procedure, copies of the draft Project Performance Assessment Report will be shared with relevant government officials for their review and comment.

### Transformation of Agriculture Sector Program Phase 3 Program-for-Results (P148927)

#### Basic Data

Country	Rwanda	World Bank IDA financing original commitment	US\$294,000,000
		World Bank IDA financing revised commitment	US\$340,000,000
Global Practice	Agriculture	Planned program cost	US\$1,200,000,000
Project name	Rwanda Transformation of Agriculture Sector Program Phase 3 Program-for-Results	Revised program total cost	US\$1,218,240,000
Project ID	P148927	Actual World Bank IDA amount disbursed	US\$389,600,000
Financing instrument	Program-for-Results Financing	Environmental assessment category	n.a.
Financing source	IDA-55480, IDA-59620, TF-19208, TF-A6465		

#### Dates

Event	Original Date	Actual Date
Approval	October 31, 2014	October 31, 2014
Effectiveness	January 31, 2015	December 11, 2014
Midterm review	n.a.	September 21, 2015
Restructuring	n.a.	February 28, 2017
Closing	March 31, 2017	September 30, 2018

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# Summary

## Background and Description

Rwanda's Vision 2020, the national vision and policy framework for the country's development, was laid out in the Second Economic Development and Poverty Reduction Strategy Paper (2013–18), which delineated agriculture as a key sector and a significant engine of inclusive growth for the country. Agricultural transformation, especially through competitive value chain development, was expected to boost growth in both the formal and informal sectors, with the effect of reducing the proportion of the population dependent on agriculture. In addition, there was considerable potential to increase productivity, commercialization of agriculture production, and self-employment in small on- and off-farm businesses, thereby contributing to poverty reduction, income gains, and increased prosperity. To contribute to the goals of the Second Economic Development and Poverty Reduction Strategy Paper, the Ministry of Agriculture and Animal Resources launched the Third Phase of the Transformation of Agriculture Sector Program (2013–17; known by its French acronym, PSTA 3). According to PSTA 3, the broad goals of Rwanda's Agricultural Transformation Strategy are the following: (i) to transform Rwandan agriculture from a subsistence sector to a knowledge-based, value-creating sector; and (ii) to grow the sector as rapidly as possible, in relation to both production and commercialization, to increase rural incomes and reduce poverty (MINAGRI 2013).

PSTA 3 was the third out of four phases of the government's agricultural transformation program, which started in 2004 and will last until 2024. The World Bank has been supporting the government's agricultural transformation program since its first phase through six operations with different financing instruments (see appendix H for details). One of the six operations is the subject of this Project Performance Assessment Report (PPAR): the Rwanda Transformation of Agriculture Sector Program Phase 3 Program-for-Results (PforR 1), which was the first operation with the PforR financing instrument in the agriculture sector in Rwanda for the Food and Agriculture Global Practice in the World Bank. This PPAR will, where relevant, provide information on the results of the other five operations to discuss in what ways they are synergistic with PforR 1.

The program development objective (PDO) of PforR 1 was “to increase and intensify the productivity of the Rwandan agricultural and livestock sectors and expand the development of value chains” (World Bank 2014a, 4).

## Results

The results presented in this section track the six key transformational drivers of inclusive agricultural growth that were used by PforR 1 (World Bank 2014d).<sup>1</sup> Refer to the Implementation Completion and Results Report Review for the actual results of the other indicators (World Bank 2021).

1. **Land husbandry.** The area with soil erosion control increased to 1,033,645 hectares, or 101 percent of the target (disbursement-linked indicator [DLI] 1, key performance indicator [KPI] 1). Irrigated lands increased to 48,508 hectares, or 109 percent of the target (DLI 2, KPI 2).
2. **Technology and research.** The percentage of agricultural land under modernized agricultural technologies increased to 31 percent, or 91 percent of the target (PDO indicator 1).<sup>2</sup> The number of enhanced technology innovations introduced by the public or private sector, or both, and the farmers' adoption rate reached an additional 20 technologies and 54.5 percent, respectively, or 125 percent and 78 percent of the targets (DLI 4, KPI 5).<sup>3, 4</sup>
3. **Agriculture finance.** The total amount of agriculture finance lending for farmers increased to \$7 million, or 100 percent of the target (DLI 5, KPI 8).<sup>5</sup> Countrywide household-level statistics, however, implied that no significant improvements in credit use among farmers were observed.
4. **Private sector value chain development.** The total production value and export value of major competitive value chains were \$2.873 billion and \$356.5 million, respectively (KPI 7). Private sector investments in the agriculture sector (domestic and foreign) increased from the baseline of \$513 million to \$758.5 million, or 104 percent of the target (KPI 9).
5. **Market-oriented infrastructure.** Results related to market-oriented infrastructure were not measured by the results framework of PforR 1.
6. **Institutional development.** The capacities of government institutions in the agriculture sector were developed as shown by the results in the following sentences. A management information system was built and operationalized (DLI 6, KPI 12, and Program Action Plan [PAP] 3.2). A report on seeds, fertilizers, and agriculture finance was published (DLIs 7 and 8, and KPI 13).

The output-level results achieved through the six drivers contributed to increases in the average productivity levels of major food and export crops (cassava and coffee) and of livestock commodity (milk) to 19 tons per hectare, 2.8 kilograms per tree per year, and 6.3 liters per cow per day, respectively, or 100 percent, 100 percent, and 97 percent of the

targets (DLI 3, KPI 3). The percentage of agriculture exports increased to 23 percent, or 92 percent of the target (PDO indicator 2).

## **What Worked and Why?**

### **Design and Preparation**

The close alignment of the DLIs to PSTA 3 strategic programs and subprograms accelerated achievement of results, especially in the enhancement of land husbandry and increases in productivity (see appendix D). DLI 1 (increased land area with soil erosion control measures), DLI 2 (increased irrigation areas), and DLI 3 (increased average crop yields for cassava, coffee, and milk) were highly relevant to program 1 (agriculture and animal resource intensification) and closely aligned to subprogram 1.1 (soil conservation and land husbandry) and subprogram 1.2 (irrigation and water management). Soil erosion control using terraces and water provision using irrigation systems have been two of the priority activities in the strategies of the Ministry of Agriculture and Animal Resources since the second phase of PSTA (PSTA 2; 2009–12). Construction of radical and progressive terraces secured funding from various government institutions at the central and district levels and attracted funding from various external sources. The close alignment among the government's programs and the DLIs influenced the design of the incentive system in the field in terms of its mechanics, targets, reporting, and verification, thus incentivizing stakeholders and facilitating the achievement of targets.

The PforRs strengthened the World Bank's partnership with the government of Rwanda by facilitating a dialogue between them on necessary reforms for agricultural transformation. The government acknowledged the application of the PforR financing instrument as a signal of trust and confidence in country systems that were developed through the positive results of prior operations supported by the World Bank. PforR 1 successfully encouraged the government to initiate urgently needed policy reforms.

The World Bank's operations in Rwanda's agriculture sector reflected the global and national demands to address food security and nutrition challenges. Rwanda demonstrated its commitment to achieving agricultural transformation by being the first country to sign the Comprehensive Africa Agriculture Development Programme in 2007 and by implementing the Malabo Declaration on Accelerated Agricultural Growth and Transformation for Shared Prosperity and Improved Livelihoods on track. The World Bank's operations in Rwanda started to include indicators related to food security and nutrition at the restructuring of the Land Husbandry, Water Harvesting and Hillside Irrigation Project and the approval of PforR 1. By establishing an incentive system in relation to DLI 7 and KPI 13, PforR 1 supported the accelerated updating of the National



Agriculture Policy, which balanced the productivity focus of previous government reforms with a more explicit focus on food security and nutrition. Moreover, the PforR 2—under the Fourth Phase of the Transformation of Agriculture Sector Program (2018–24; PSTA 4)—included PAP 4, for the Ministry of Agriculture and Animal Resources to strengthen the monitoring and reporting on food security and nutrition, resulting in the development and endorsement of the Food Security and Nutrition Monitoring System.

### **Implementation and Supervision**

Coordination and engagement for the agriculture sector were strengthened through the evolving coordination framework. The World Bank has supported the strengthening of the sectorwide approach in the agriculture sector since 2009.<sup>6</sup> A sectorwide approach in Rwanda’s agriculture sector was effective in attracting development partners in project funding and implementation, coordinating activities among partners, and establishing a funding mechanism that combined resources in a single funding channel. However, there were relatively few engagements of private sector representatives and nongovernmental organizations in the Agriculture Sector Working Group at the closure of PforR 1, which led to the call to establish the Public-Private Dialogue platform under PforR 2. Instead of the Agriculture Sector Working Group, PforR 1’s steering committee was able to enhance donor coordination with the incentive system based on DLIs. Under PSTA 3 and PSTA 4, the steering committees of the PforRs followed the positive results of the sectorwide approach. The steering committees established a coordinated framework to combine funding from development partners and attracted the attention of the agriculture minister, whose presence at meetings reinforced the activities under the value chain development.

Lending for the agriculture sector for farmers (DLI 5) increased through savings and credit cooperatives near the irrigated and terraced areas under PSTA 3. Regarding the theory of change described in chapter 1 (Objective, Design, and Financing section), some evidence suggests that the land husbandry activities under PSTA 3 contributed to the increase in agricultural lending. The relationship between the land husbandry infrastructure and the beneficiaries’ financial behavior was found to be significantly positive by a statistical analysis under one of the parallel World Bank operations on land husbandry. The positive relationship was also confirmed by a savings and credit cooperative located close to the radical terraces and irrigation systems, which opened two new branches to respond to the increased demand for financial services in relation to the intervention area.

Decentralization of agricultural expenditures improved under PSTA 3 compared with PSTA 2 in terms of the transfer of funds and financial responsibilities. The share of local

government spending, including interagency transfers out of the total government expenditures in agriculture, improved from 20.6 percent under PSTA 2 to 23.5 percent under PSTA 3. Moreover, the share of the Ministry of Agriculture and Animal Resources in disbursing the total expenditures of the ministry and affiliated institutions dramatically decreased from 83.9 percent in fiscal years (FY)13–14 to 26.7 percent in FY15–16. The ministry transferred many of its direct budget implementation activities to the Rwanda Agriculture and Animal Resources Development Board with support from the PAPs.

The reforms of the Rwanda Agriculture and Animal Resources Development Board and the National Agricultural Export Development Board showed positive outcomes at the time of the PPAR. The PPAR’s survey suggests that a high level of satisfaction with the support from the Rwanda Agriculture and Animal Resources Development Board and the National Agriculture Export Development Board and the increase in their self-rating on performance in Imihigo (a system of performance contracts to increase accountability and transparency) from 2014 to 2022 might be linked, although further analysis is required.

Knowledge and experience gained from implementation of PforR 1 were effectively used to design PforR 2. Stronger emphasis was given to value chain development in PforR 2, making it a more focused program. The independent results verification agency was changed from the Office of the Prime Minister in PforR 1 to the Office of the Auditor General in PforR 2, accelerating the hiring of additional staff to conduct technical audit in the agriculture sector.

## **What Didn’t Work and Why?**

### **Design and Preparation**

Attribution of results to PforR 1 is difficult to establish. Achievements by parallel projects funded by the World Bank and other development partners for expanding areas with terracing and irrigation systems were difficult to differentiate from achievements by PforR 1. The Independent Evaluation Group (IEG) made all the feasible verification efforts, but the question remains whether the World Bank might have disbursed funds for the same result twice, once by funding the project implementation units and once by disbursing funds for DLI achievements through PforR 1. However, the achievements of PforR 1 were reportedly significantly higher than the achievements of the parallel projects. This points to the probable contribution from PforR 1 on top of what was done by the parallel projects, though further data would be required to support this argument. The sheer magnitude of the water, land, and soil challenges in Rwanda might have necessitated multiple projects that aimed to be synergistic.

The reliability of data that were reported as achievements in irrigation and terracing under PforR 1 was weak, raising questions regarding to what extent the efficacy of PforR 1 was adequately measured and verified. Although a majority of disbursement-relevant results met or exceeded their targets, there were persistent discrepancies between reported results and observations in the field. Data discrepancies were pointed out by the independent review of the PforR and academic research on the quality of agricultural data in Rwanda. There is a persistent struggle over how to sample and measure multiple and difficult variables, especially when they depend on responses from farmers and public workers.

Views differ on what might have contributed to the discontinuation of DLI 5 after additional financing. One view is that it was discontinued because the government was satisfied with the results achieved up to year 3. Another view is that achieving DLI 5 was beyond the direct control of the responsible ministry. During IEG's interviews, respondents indicated that the centralized fund disbursement mechanism in public channels might not directly incentivize private financial institutions to increase agricultural lending to farmers. It is important to monitor this aspect in successor projects.

### **Implementation and Supervision**

There is insufficient evidence regarding the effectiveness of the advance disbursement instrument, particularly where there are gaps in human resources. During IEG's interviews, multiple respondents from different institutions mentioned the persistent challenge of insufficient allocation and prolonged disbursement of funds from the Ministry of Finance and Economic Planning to the Ministry of Agriculture and Animal Resources due to limited human resources.

Increases in absolute expenditures on wages in the agriculture sector have not resulted in strengthened technical capacity of the Ministry of Agriculture and Animal Resources to request and execute budgets. PforR 1 implemented an action plan (PAP 4.15) in response to findings in the Agriculture Public Expenditure Review 2016, which noted a relatively low recurrent expenditure in agriculture and a small and declining share of personnel costs and recommended conducting studies to determine the optimal balance between administrative and development costs and between wage and nonwage costs. At program closing, the share of wages in recurrent expenditure rose sharply because of increases in absolute expenditures on wages from FY17. As noted in the previous paragraph, gaps in human resources have not been sufficiently addressed by the increases in absolute expenditures on wages in the agriculture sector.



The lack of comprehensive measurements of the private sector and public-private partnership investments prevented further analysis of their contributions, which would be important to address underinvestment in agricultural research and technology transfer. The failure to measure these was caused by indicators that were insufficiently disaggregated by source of investment.

The institutional capacity of farmers’ organizations (agricultural cooperatives and water users’ organizations) was not developed to ensure sustainability after program closing. At the time of the PPAR, adoption of irrigation-related technologies was observed less among farmers than others. The water users’ organizations relied on the government to conduct major repairs of the irrigation systems but repaired minor damage and cleaned waterways with community support. The water fee collection procedures varied based on the capacity of staff members of the water users’ organizations and their relationships with agricultural cooperatives.

There are two views regarding whether PforR 1’s development of value chains for agricultural products went beyond the local market level. It was reported that between 2014 and 2018, capacity increased for processing and value addition for locally produced agricultural and livestock products, including rice, maize, horticultural products, and milk. But the PPAR’s survey of agricultural extension service officers and the Comprehensive Food Security and Vulnerability Analysis suggest that the farmers mainly produce crops for consumption within their local or neighboring communities, not for sale in a larger-scale value chain across the country or beyond its borders.

IEG project ratings are described in table S.1 and in appendix A.

**Table S.1. ICR, ICR Review, and PPAR Ratings**

Indicator	ICR	ICR Review	PPAR
Outcome	Moderately satisfactory	Moderately satisfactory	Moderately satisfactory
Bank performance	Moderately satisfactory	Moderately satisfactory	Moderately satisfactory
Quality of monitoring and evaluation	Modest	Substantial	Modest

Sources: World Bank 2019e; World Bank 2021.

Note: The ICR is a self-evaluation by the responsible Global Practice. The ICR Review is an intermediate Independent Evaluation Group product that seeks to independently validate the findings of the ICR. ICR = Implementation Completion and Results Report; PPAR = Project Performance Assessment Report.

The evaluation methodology and evidence sources are described in appendix C.

## Lessons

This assessment offers the following lessons:

- PforRs should start with relatively mature and ready-to-implement activities, in this case including soil erosion control and enhanced technological innovation, which led to early results in land husbandry and increased agricultural productivity. It is important to start with a program with a geographically or thematically narrow and simple scope, which would allow institutions and systems to adapt over time and strengthen the preparation for highly relevant PforR-related processes, such as the monitoring and evaluation system and the DLI verification process. An intervention involving a multisector or multilevel approach covering several geographic regions is difficult to implement, particularly with many indicators and PAPs to be managed through interagency collaboration. Designs initially should be kept simple for eventual scale-up and should include close coordination among the central-, district-, and sector-level authorities so that learning opportunities can be used to attain stronger institutional and managerial capacity for similar operations. A PforR operation trying to address at once almost all constraints for commercialization of farmers (production intensification, research and technology transfer, private sector-led value chain development, market-oriented infrastructure, agricultural finance, institutional strengthening) may not achieve substantial results in all areas.
- Incentivizing institutional reforms is an added value of the PforR instrument that needs to be internalized by all stakeholders across sectors and at both national and subnational levels. PforR operations often horizontally support large and complex government programs. In a sector that faces challenges at different levels, there may be parallel projects by development partners that aim to contribute to the same envisioned outcome of the government program. When compared with the World Bank's two investment project financing projects implemented at almost the same time, the strength of the PforR instrument is its potential to contribute to institutional strengthening and reforms. It is important to ensure that stakeholders across sectors and administrative levels are aware of the current systems or their common practices and behaviors and are willing to change them. Explicitly including an institutional strengthening objective in a PDO statement and preparing a solid theory of change can highlight key activities that are expected to trigger reform processes.
- Any gaps in capacity and eligibility to request and execute budgets need to be addressed first to ensure the effective functioning of the fund disbursement mechanism—based on DLI achievements—from the central treasury to the line

ministry and affiliated institutions. The evaluation team received comments from multiple sources that indicated limited human resources, especially at the technical level, were associated with the Ministry of Agriculture and Animal Resources' challenges in securing sufficient allocation and timely disbursement of funds from the Ministry of Finance and Economic Planning (interview). Stakeholders in the implementing agencies considered implementation of the PforR instrument more labor intensive than other World Bank financing instruments. Allocating adequate staff time and financial resources to implement and report activities and coordinate with cross-sectoral stakeholders is important for the success of PforR operations. In addition, the centralized fund disbursement mechanism in public channels might not directly incentivize private financial institutions to increase agricultural lending to farmers, affecting the discontinuation of DLI 5 after additional financing. Fund disbursement mechanisms and DLIs must be carefully designed to provide adequate incentives to key drivers to achieve the envisioned results.

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<sup>1</sup> The six key transformational drivers of inclusive agricultural growth were land husbandry, technology and research, agriculture finance, private sector value chain development, market-oriented infrastructure, and institutional development.

<sup>2</sup> The methodology for measuring program development objective indicator 1 was modified during implementation, as described in the aide-mémoire of the third Implementation Support Mission from March 2016. First, concerning the categories of technologies, irrigation and soil erosion control measures were included (in addition to improved seeds, fertilizer, and mechanization) and differential weights were used to arrive at a composite index. Second, the share of agricultural land covered by these technologies was used as opposed to the share of farm families adopting them.

<sup>3</sup> Adoption rates refer to farmers who adopt these improved or new innovations, and those introduced two years previously to account for the lag in adoption rates (World Bank 2014e).

<sup>4</sup> Detailed descriptions of the 20 technologies were not provided in available documents.

<sup>5</sup> The actual and target values for fiscal years 2016–17 were not provided (World Bank 2019e).

<sup>6</sup> Through the Land Husbandry, Water Harvesting and Hillside Irrigation Project (P114931, 2009–18), which included component C: implementation through the ministerial sectorwide approach structure.





# 1. Background, Context, and Design

## Background and Context

1.1 **Background.** Rwanda is a small landlocked country covering 24,670 square kilometers, of which 73.4 percent is agricultural land.<sup>1</sup> Because 85 percent of the land mass is hilly terrain (World Bank 2014d), most of the agricultural land is located on slopes. It is one of the most densely populated countries in Africa and is projected to have a population of 13.2 million, with 524 inhabitants per square kilometer, in 2022 under the medium scenario (NISR and MINECOFIN 2014).<sup>2</sup> Of all its workforces, 66 percent work on farms as either independent farmers (51 percent) or wage workers (15 percent; NISR 2021b). Rwanda has made a remarkable transition from genocide to peace and development. Between 2000 and 2012, gross domestic product growth averaged 8.1 percent per year. Development efforts and results have been significant. Rwanda reduced poverty from 60.3 percent in 2001 to 38.2 percent in 2017 (MINECOFIN 2002; NISR 2018). Increases in agriculture production and commercialization were the key drivers of poverty reduction and accounted for more than 45 percent of the total (World Bank 2014d).

1.2 Rwanda's Vision 2020, the national vision and policy framework for the country's development, was laid out in the Second Economic Development and Poverty Reduction Strategy Paper (2013–18), which identified agriculture as a key sector and a significant engine of inclusive growth for the country. Agricultural transformation, especially through competitive value chain development, was expected to boost growth in both the formal and informal sectors, with the effect of reducing the proportion of the population dependent on agriculture. In addition, there was considerable potential to increase productivity, commercialization of agriculture production, and self-employment in small on- and off-farm businesses, contributing to poverty reduction, income gains, and increased prosperity. To contribute to the goals of the Second Economic Development and Poverty Reduction Strategy Paper, the Ministry of Agriculture and Animal Resources launched the Third Phase of the Transformation of Agriculture Sector Program (2013–17; known by its French acronym, PSTA 3).

1.3 **Context.** The Rwanda Transformation of Agriculture Sector Program Phase 3 Program-for-Results (PforR 1) was designed to support the government to implement PSTA 3. According to PSTA 3, the broad goals of Rwanda's Agricultural Transformation Strategy are the following: (i) to transform Rwandan agriculture from a subsistence sector to a knowledge-based, value-creating sector; and (ii) to grow the sector as rapidly as possible, in relation to both production and commercialization, to increase rural incomes and reduce poverty (MINAGRI 2013). Several broad transformations were

envisioned as results of the strategy: (i) from guaranteeing food availability to generating food security through economic growth; (ii) from farmers being passive recipients to farmers being active market players with new skills; (iii) from government being a direct provider to government being a facilitator of the private sector; and (iv) from supplying mostly the domestic market to becoming an exporter to the region (MINAGRI 2013). PSTA 3 had 4 programs and 24 subprograms. The results framework of PSTA 3 presented six core drivers of inclusive agricultural growth: (i) land husbandry, (ii) technology and research, (iii) agriculture finance, (iv) private sector value chain development, (v) market-oriented infrastructure, and (vi) institutional development (World Bank 2014d).

## Objective, Design, and Financing

1.4 **Objective.** The program development objective (PDO) of PforR 1 was “to increase and intensify the productivity of the Rwandan agricultural and livestock sectors and expand the development of value chains” (World Bank 2014a, 4). The formulation of the PDO was identical in the financing agreement and the Program Appraisal Document (World Bank 2014a, 2014d).

1.5 **Design.** PSTA 3 operated across the country. PforR 1’s disbursement-linked indicators (DLIs), key performance indicators (KPIs), and Program Action Plans (PAPs) were aligned with all of PSTA 3’s four programs and with 13 of its 24 subprograms (see appendix D).

1.6 **Financing.** At appraisal, the cost for PforR 1 was estimated at \$1,200 million, of which \$100 million was expected from new International Development Association (IDA) credit financing through the PforR instrument, \$194 million from existing IDA credit financing, \$300 million from the government of Rwanda as borrower contribution, and \$606 million from cofinancing by various other donors. In March 2015, a multidonor trust fund of \$50.60 million was approved to support the implementation of PforR 1. In February 2017, additional financing of \$46 million from the IDA credit was approved, plus an additional \$9.24 million for the multidonor trust fund. At completion, the actual total cost for PforR 1 was \$1,218.24 million (102 percent of the appraisal amount), of which \$140.88 million was disbursed from the IDA credit, \$59.84 million from the grant financing of the multidonor trust fund, \$248.72 million from existing IDA credit financing, \$368.40 million from the borrower contribution, and \$400.30 million from donor cofinancing.

1.7 PforR 1 was approved by the Board of Executive Directors on October 31, 2014. It became effective on December 11, 2014. The midterm review was published on



September 21, 2015. PforR 1 was closed on September 30, 2018, six months after the original closing date of March 31, 2018.

1.8 PforR 1 had four intermediate results areas that were closely aligned with PSTA 3's four programs (table 1.1). The intermediate results areas were almost identical to PSTA 3's programs, with only minor revisions.

**Table 1.1. PforR 1's Intermediate Results Areas and PSTA 3's Programs**

PforR 1's Intermediate Results Areas	PSTA 3's Programs
1 Agriculture and Animal Resource Intensification	Agriculture and Animal Resource Intensification
2 Research, Technology Transfer and Organization of Farmers	Research, Technology Transfer, Advisory Services and Professionalization of Farmers
3 Private Sector-Driven Value Chain Development and Expanded Investments	Value Chain Development and Private Sector Investment
4 Institutional Results-Focused Development and Cross-Cutting Issues	Institutional Development and Agricultural Cross-Cutting Issues

Sources: MINAGRI 2013; World Bank 2014b.

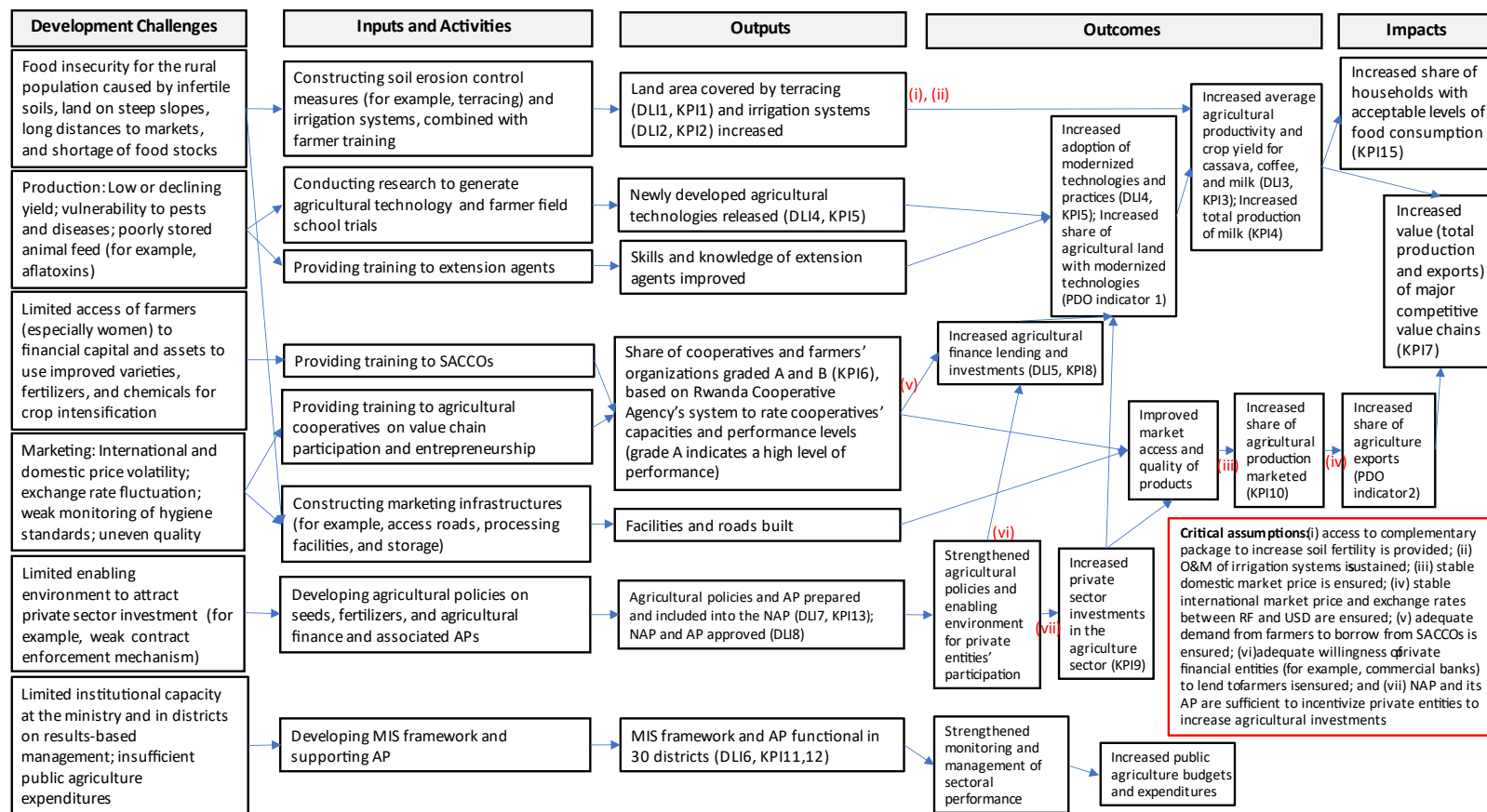
Note: PforR = Program-for-Results; PSTA 3 = Third Phase of the Transformation of Agriculture Sector Program.

1.9 The Ministry of Agriculture and Animal Resources, the Rwanda Agriculture and Animal Resources Development Board, and the National Agricultural Export Development Board were the implementing agencies of PSTA 3. The Rwanda Agriculture and Animal Resources Development Board implemented program 1 (agriculture and animal resource intensification) and program 2 (research, technology transfer, advisory services, and professionalization of farmers), which accounted for nearly 60 percent (52.8 percent and 7.1 percent, respectively) of the total PSTA 3 budgets in the Agriculture Sector Investment Plan (World Bank 2016). The Ministry of Agriculture and Animal Resources and the National Agricultural Export Development Board led the implementation of 31.5 percent for program 3 (value chain development and private sector investment), and the ministry led the implementation of 8.7 percent for program 4 (institutional development and agricultural cross-cutting issues; World Bank 2016).

1.10 PforR 1's theory of change (TOC; figure 1.1) envisioned addressing development challenges including (i) lack of consideration of environmental sustainability in land husbandry and irrigation to address soil erosion and water conservation; (ii) quality and quantity issues with raw materials and inputs; (iii) limited and costly rural infrastructure; (iv) lack of working capital and long-term credit; (v) low technical capacity of farmers; (vi) limited sector innovation; (vii) small existing base of agroprocessing; and (viii) low capacity of value chain stakeholders for generating, identifying, and tapping domestic, regional, and international demand (MINAGRI 2013). The TOC envisioned that activities including constructing terraces and irrigation

systems, conducting research on agricultural technologies, training farmers to use new agricultural technologies, and strengthening the technical and administrative capacity of agricultural cooperatives would result in outputs such as increased agricultural lands with soil and water conservation measures, more farmers adopting new agricultural technologies, and improved service delivery of agricultural cooperatives, contributing to, for example, increased yields of major crops and livestock products and increased production and export values of agricultural products. The TOC also envisioned that activities including building market-oriented infrastructure (feeder roads, markets, processing and postharvesting facilities, and milk collection centers); training cooperatives on organization, management, accounting, and internal controls; and providing training on capacity strengthening for value chain development with a focus on gender equality would result in outputs such as increased market-oriented infrastructures and increased lending to farmers and private entities for agricultural investment. These in turn would contribute to outcomes such as enhanced value chains with active participation of farmers and private entities, and increased commercialization of agricultural and livestock products. The TOC also envisioned that activities including developing the National Agriculture Policy and strategies for the Rwanda Agriculture and Animal Resources Development Board and the National Agricultural Export Development Board; developing and rolling out the agriculture management information system to all 30 districts; and providing training on fiduciary, environmental, and social aspects to the government institutions at the central and district levels would result in outputs such as strengthened institutional capacity of the government institutions. This in turn would contribute to outcomes such as a strengthened environment for privatization and decentralization of the sector. In the long term, these outcomes were envisioned to contribute to impacts such as improved food security and livelihoods and reduced rural poverty.

Figure 1.1. Simplified Theory of Change



Source: Independent Evaluation Group.

Note: AP = action plan; DLI = disbursement-linked indicator; KPI = key performance indicator; MIS = management information system; NAP = National Agricultural Policy; O&M = operation and maintenance; RF = Rwanda franc; PDO = program development objective; SACCO = savings and credit cooperative; USD = United States dollar.

1.11 The main evaluation question of the Project Performance Assessment Report (PPAR) is, To what extent was the Transformation of Agriculture Sector Program Phase 3 PforR successful in achieving its targeted results and development objectives and in contributing to the government’s agriculture sector program?

1.12 Subquestions to the evaluation question are the following: What were the key drivers of successful PforR operations? To what extent did DLIs incentivize strengthening the program’s results orientation, performance, and outcomes? Were the results and outcomes sustained after the closure of PforR 1?

1.13 The evaluation question—if answered with valid evidence—should lead to lessons on the key activities that PforRs should focus on to contribute to the goals of the sector they support.

## 2. Results

2.1 The results presented in this section track the six key transformational drivers of inclusive agricultural growth that were used by PforR 1 (World Bank 2014d): land husbandry, technology and research, agriculture finance, private sector value chain development, market-oriented infrastructure, and institutional development. The indicators in the results framework of PforR 1 were mainly focused on outputs, as discussed in section 1 of appendix A.

2.2 The land husbandry targets were highly achieved. The area with soil erosion control increased from the baseline of 848,538 hectares in fiscal years (FY)12–13 to 1,033,645 hectares in FY16–17, exceeding the target of 1,023,479 hectares (DLI 1, KPI 1; World Bank 2019e). Irrigated lands increased from the baseline of 27,796 hectares in FY12–13 to 48,508 hectares in FY16–17, exceeding the target of 44,500 hectares (DLI 2, KPI 2; World Bank 2019e).

2.3 The technology and research results were mixed at program closing. The number of enhanced technology innovations introduced by the public or private sector, or both, and the farmers’ adoption rate increased from the baseline of 5 technologies and 25 percent in FY12–13 to an additional 20 technologies and 54.5 percent in FY16–17,<sup>9, 10, 11, 12</sup> meeting the targets of an additional 16 technologies but not meeting the target of an adoption rate of 70 percent (DLI 4, KPI 5; World Bank 2019e). The percentage of agricultural land under modernized agricultural technologies increased from the baseline of 19 percent to 31 percent, which came close to meeting the target of 34 percent (PDO indicator 1;<sup>13</sup> World Bank 2019e); this happened because the methodology for measuring PDO indicator 1 was modified during implementation to include irrigation

and soil erosion control measures in the categories of technologies (in addition to improved seeds, fertilizer, and mechanization; World Bank 2016).

2.4 The soil erosion control, irrigation, and technology adoption described in the previous two paragraphs contributed to increasing the productivity of the agriculture sector (the first objective of the PDO). The average productivity levels of major food and export crops (cassava and coffee) and livestock commodity (milk) increased from the baseline of 15 tons per hectare, 2.2 kilograms per tree per year, and 4 liters per cow per day, respectively, in FY12–13 to 19 tons per hectare, 2.8 kilograms per tree per year, and 6.3 liters per cow per day in FY16–17 (DLI 3, KPI 3; World Bank 2019e). The targets for cassava (19 tons per hectare) and milk (6.21 liters per cow per day) were fully met, and that for coffee (2.9 kilograms per tree per year) was almost met (DLI 3, KPI 3; World Bank 2019e). Considering that the 2016 drought resulted in low crop yields from September 2015 to January 2017 (NISR 2018), the increases in the average productivity levels of major food and export crops and livestock commodity under natural disaster conditions suggest strengthened resilience of the agriculture and livestock sector in Rwanda.

2.5 The agriculture finance targets were mostly achieved. The total amount of agriculture finance lending for farmers increased from the baseline of \$3.6 million in FY12–13 to \$7.0 million in FY15–16, meeting the FY15–16 target of \$7.0 million (DLI 5, KPI 8; World Bank 2019e).<sup>14</sup>

2.6 Targets for private sector value chain development were partially achieved. The total production value and export value of major competitive value chains were increased from the baselines of \$2.3 billion and \$132 million, respectively, in FY12–13 to \$2.873 billion and \$356.5 million in FY16–17 (KPI 7; World Bank 2019e). The actual export value met the target of \$309 million (KPI 7; World Bank 2019e). Private sector investments in the agriculture sector (domestic and foreign) were increased from the baseline of \$513 million to \$758.5 million, meeting the target of \$730 million (KPI 9; World Bank 2019e). No target value, however, was set for total production value in FY16–17 (KPI 7; World Bank 2019e). The share of agricultural production marketed increased from the baseline of 21 percent in FY12–13 to 23 percent in FY16–17, not meeting the target of 25 percent (KPI 10; World Bank 2019e).

2.7 The indicators related to the outcome of expansion of the development of value chains (the second objective in the PDO) partially met their targets. The share of agriculture exports slightly increased from the baseline of 22 percent in FY12–13 to 23 percent in FY16–17, not meeting the target of 25 percent in FY16–17 (PDO indicator 2; World Bank 2019e).



2.8 Results for market-oriented infrastructure were not measured by the results framework of PforR 1.

2.9 Capacity development of the government institutions in the agriculture sector was incorporated in results-based disbursement conditions that were met under PforR 1. A management information system was rolled out in 30 districts, producing regular reports that included monitoring indicators of operation and maintenance of rural infrastructure (DLI 6, KPI 12, and PAP 3.2; World Bank 2019e). The report on seeds, fertilizers, and agriculture finance was integrated into the National Agriculture Policy, which was approved by the Agriculture Sector Working Group in June 2017 (DLI 7, DLI 8, and KPI 13; World Bank 2019e). A capacity development action plan for districts was prepared, and key milestones of the action plan were implemented (KPI 11; World Bank 2019e).

## **3. What Worked and Why?**

### **Design and Preparation**

3.1 The government's strategies to transform the agriculture sector from subsistence farming to modernized, commercialized farming aligned well with the World Bank's green revolution approach for Africa. The World Bank's vision of ensuring food security and profitable agriculture for African farmers will require a revolution in smallholder farming based on professionalized inputs such as improved seeds, chemical fertilizers, and pesticides, distributed through private-friendly state interventions in input markets (World Bank 2008). Rwanda applied the green revolution approach by introducing the Crop Intensification Program in August 2007, which entailed (i) land use consolidation; (ii) sale of fertilizers and improved seeds; (iii) provision of proximity extension services; and (iv) improvement of postharvest handling and storage (Ndushabandi et al. 2018). This program was integrated into program 1 of PSTA 3 (agriculture and animal resource intensification).

3.2 The DLIs' alignments with PSTA 3 strategic programs and subprograms accelerated achievements of results, especially in enhancement of land husbandry and increases in productivity. The World Bank's prior support, parallel projects, or both, have aligned their objectives to the government's strategies and its series of agricultural transformation programs, as described in the relevant sections of the reviews by the Independent Evaluation Group (IEG) of the respective Implementation Completion and Results Reports (World Bank 2019a, 2019d). Under PforR 1, not only the objectives but also the indicators used for measuring results for fund disbursements were aligned with the government strategy. PforR 1's DLIs were designed to be closely aligned with PSTA 3's strategic programs and subprograms (see appendix D). DLI 1 (increased land

area with soil erosion control measures), DLI 2 (increased irrigation areas), and DLI 3 (increased average crop yields for cassava, coffee, and milk) were highly relevant to program 1 (agriculture and animal resource intensification) and closely aligned with subprogram 1.1 (soil conservation and land husbandry) and subprogram 1.2 (irrigation and water management). Soil erosion control using terraces and water provision using irrigation systems have been two of the priority activities in the strategies of the Ministry of Agriculture and Animal Resources since the second phase of PSTA (PSTA 2; MINAGRI 2009). At the time of the PPAR, the shares of agricultural households that implement soil erosion control measures and irrigation practices had grown. According to the Agricultural Household Survey 2020, these increased from 65.7 percent and 10.1 percent, respectively, in 2017 to 83.8 percent and 14.6 percent in 2020 (NISR 2021a).

3.3 Construction of radical and progressive terraces secured funding from various government institutions at the central and district levels (the Ministry of Agriculture and Animal Resources, the Rwanda Agriculture and Animal Resources Development Board, the Ministry of Local Government, and tea factories investing in districts; RAB 2016) and attracted external funding from various sources (the World Bank, the European Union, and the Korea International Cooperation Agency). Moreover, the part of DLI 3 on increased average crop yields for coffee, which measured the productivity level of kilograms of coffee cherries per tree, was aligned with subprogram 3.3 (development of priority value chains: export crops). The biggest challenge in the coffee value chains at appraisal was the low productivity in terms of the yield of cherries per tree (NAEB 2016). DLI 3 addressed one of the bottlenecks in the coffee value chain development by incentivizing the National Agriculture Export Development Board, one of the implementing agencies, to focus on improving coffee productivity per tree through granular data collection and input provision (interview). In addition, DLI 3 was aligned with the government's implementation of the zoning system in 2016, which contributed to reducing local trader activity and farmer side-selling, and benefited mills (Gerard et al. 2022). The strong links among the DLIs and the government's strategic programs and subprograms incentivized the stakeholders to try to achieve the targets, distinguishing PforR 1 from another sectoral support in agriculture (interview).

3.4 The PforRs strengthened the World Bank's partnership with the government of Rwanda by facilitating a dialogue between them on necessary reforms for agricultural transformation. Given the Ministry of Agriculture and Animal Resources' demonstrated technical and administrative capacity in implementing the sector's strategic programs, it is a natural progression to adopt the PforR instrument for this operation, as opposed to another investment project financing or development policy loan (World Bank 2014d). The government acknowledged the application of the PforR financing instrument as a sign of trust and confidence in country systems that had developed through the

positive results of prior operations supported by the World Bank (interview). PforR 1 successfully encouraged the government to initiate urgently needed policy reforms, resulting in the Public Expenditure Review in the agriculture sector in 2016, which called for a transparent management information system (Woelcke and Reichhuber 2017).

3.5 The World Bank's operations in Rwanda's agriculture sector reflected the global and national demands to address food security and nutrition challenges. Rwanda demonstrated its commitment to achieving agricultural transformation by being the first country to sign the Comprehensive Africa Agriculture Development Programme in 2007 and by implementing the Malabo Declaration on Accelerated Agricultural Growth and Transformation for Shared Prosperity and Improved Livelihoods on track.<sup>15</sup> The government emphasized the importance of a holistic approach to transform food systems for enhanced nutrition and household food security and of ensuring inclusive interventions in the food and agriculture sector (Malabo Montpellier Panel 2021). Since the launch of the Global Agriculture and Food Security Program in 2010 as a multilateral financing platform to improve food and nutrition security, the international community started to include food security and nutrition aspects in development interventions. In Rwanda, the World Bank's operations have included indicators related to food security and nutrition since approximately 2013. The Land Husbandry, Water Harvesting and Hillside Irrigation Project (LWH) added two new intermediate results indicators at the 2013 restructuring (households with acceptable food consumption and kitchen gardens constructed) followed by securing additional financing from the Global Agriculture and Food Security Program (World Bank 2018b). PforR 1 had a KPI relevant to food security and nutrition (increased percentage of households with acceptable levels of food consumption) since appraisal in 2014 (World Bank 2019e). PforR 1 contributed to updating the National Agriculture Policy in 2018, which balanced the productivity focus of previous government reforms with a more explicit focus on "food security, nutritional health and sustainable agricultural growth from a productive, green and market-led agricultural sector" (Republic of Rwanda 2018). LWH and PforR 1 supported the establishment of kitchen gardens, which were considered by both male and female farmers to improve food security and nutrition at the household level (Bayisenge 2021). PforR 2 included a PAP for the Ministry of Agriculture and Animal Resources to strengthen the monitoring and reporting on food security and nutrition (PAP 4; World Bank 2018c), resulting in the development and endorsement of the Food Security and Nutrition Monitoring System, through which data collection for the Comprehensive Food Security and Vulnerability and Nutrition Analysis Survey has been completed (MINAGRI 2022).

## Implementation and Supervision

3.6 Coordination and engagement for the agriculture sector were strengthened through an evolving coordination framework. Since its introduction to the agriculture sector in the late 1990s, the sectorwide approach has aimed to address problems in the management of aid (including high fragmentation, duplication, and transaction costs) and bring all sector stakeholders together under one government-led sectorwide policy framework (Cabral 2010). In 2008, the Ministry of Agriculture and Animal Resources signed a memorandum of understanding with development partners to establish the sectorwide approach, with the aim of gradually delegating all managerial responsibilities, including authority and responsibility for financial management, to the ministry's departments and units in accordance with agreed-on work plans and budgets (MINAGRI 2009). The World Bank has supported strengthening of the sectorwide approach since 2009.<sup>16</sup> By September 2013, the Agriculture Sector Working Group became operationalized, cochaired by the Permanent Secretary of the Ministry of Agriculture and Animal Resources and a representative from the lead donor agency (the European Union at that time; the World Bank became the co-chair during implementation of PforR 2 under PSTA 4).<sup>17</sup> Rwanda's political leadership, which was well attuned to modern management practices, developed strong Sector Working Group arrangements (Taylor 2014). The sectorwide approach in Rwanda's agriculture sector was effective in attracting development partners in project funding and implementation, coordinating activities among partners, and establishing a funding mechanism that combined resources in a single funding channel (World Bank 2018b).

3.7 However, despite the original intent, the sectorwide approach is used as a resource mobilization tool of the sectoral ministry at the central level rather than a coordination platform among the central ministry and other state and nonstate actors and institutions (Evans, Cabral, and Vadrjal 2006). There were relatively low engagements of private sector representatives and nongovernmental organizations in the Agriculture Sector Working Group at the closure of PforR 1 (World Bank 2019e). To strengthen private sector engagements, PforR 2 established the Public-Private Dialogue platform, which provided opportunities for private entities to coordinate with public institutions regarding agricultural commercialization. The need for this platform to be chaired by an elected private entity to strengthen the voice of private entities was mentioned during the interviews with the key stakeholders.

3.8 Under the incentive system of the DLIs, the PforRs' steering committee enhanced donor coordination. Under PSTA 3 and PSTA 4, the PforR steering committees built on the positive results of the sectorwide approach. The steering committees established a coordinated framework to combine funding from development partners (multidonor trust fund) on policy issues of direct interest to the minister, such as value chain

development (interview). The steering committees attracted the attention of the agriculture minister, whose presence at meetings reinforced the relevant activities (interview).

3.9 The lending for agriculture sector for farmers (DLI 5) increased through savings and credit cooperatives (SACCOs) near the irrigated and terraced areas under PSTA 3. DLI 5 did not receive additional financing at the restructuring in 2017 because achieving the indicator was beyond the direct control of the Ministry of Agriculture and Animal Resources (MINAGRI 2018b). It is challenging to infer a direct causal relationship between the ministry's interventions and the increase in agricultural lending from the private entities that was measured by DLI 5. However, regarding the TOC described in chapter 1 (Objective, Design, and Financing section), some evidence suggests that the land husbandry activities under PSTA 3 contributed to the increase in agricultural lending. According to the Development Impact Evaluation unit's endline impact evaluation of LWH, the relationship between the project and the beneficiaries' financial behavior (having a formal bank account and accumulating savings) was significantly positive (World Bank 2018a). The positive relationship between the land husbandry infrastructure and the financial behavior of the neighboring communities was also confirmed by an interview with a SACCO located near the radical terraces and irrigation systems built under PSTA 3. The SACCO increased the number of members and the amount of savings during PSTA 3, which enabled the SACCO to open two new branches to respond to the increased demand for financial services in the intervention area.

3.10 At the national level, the number of households accessing the formal credits increased from 247,000 in 2017 to 301,000 in 2020 (NISR 2021b). The share of agricultural households with at least one member who made savings was 68.1 percent in 2020 (NISR 2021a).

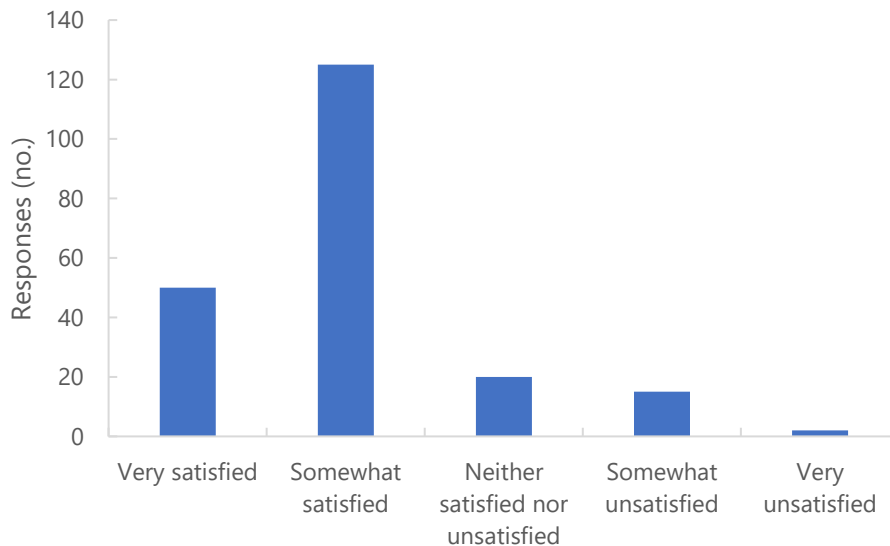
3.11 Decentralization of agricultural expenditures improved under PSTA 3 compared with PSTA 2 in terms of the transfer of funds and financial responsibilities. The share of local government spending, including interagency transfers, out of the total government expenditures in agriculture improved from 20.6 percent in FY11–12 under PSTA 2 to 23.5 percent in FY15–16 under PSTA 3 (World Bank 2016). Moreover, the share of the Ministry of Agriculture and Animal Resources in disbursing the total expenditures of the ministry and affiliated institutions (the Rwanda Agriculture and Animal Resources Development Board and the National Agriculture Export Development Board) dramatically decreased from 83.9 percent in FY13–14 to 26.7 percent in FY15–16, resulting in an increase in the share of the expenditures of the Rwanda Agriculture and Animal Resources Development Board and the National Agricultural Export Development Board from 7.4 percent and 8.7 percent, respectively, in FY13–14 to 53.8 percent and 19.5 percent in FY15–16 (World Bank 2016). The ministry has been



transferring many of its direct budget implementation activities to its affiliated institutions, especially the Rwanda Agriculture and Animal Resources Development Board. These transfers were supported by PforR 1’s PAPs, which required the affiliated institutions to finalize their strategies (PAP 1.1), implement reforms (PAP 2.1), and reconcile the accounting statements of the affiliated institutions after the merger (PAP 4.4).

3.12 The reforms of the Rwanda Agriculture and Animal Resources Development Board and the National Agricultural Export Development Board showed positive outcomes at the time of the PPAR. High satisfaction with the support provided by these boards is observed among agricultural extension officers; 83 percent in sectors and districts in all four provinces responded that they were either “very satisfied” or “somewhat satisfied” during IEG’s survey at the time of the PPAR (figure 3.1). In addition, agricultural extension officers’ self-rating on performance in Imihigo (a system of performance contracts used at all levels of government to increase accountability and transparency) at the sector and district levels improved from the time before PforR 1 to the time of the PPAR (figure 3.2). The survey suggests that the high satisfaction ratings and the increase in officers’ self-rating on performance in Imihigo from 2014 to 2022 might be linked, although further analysis is required.

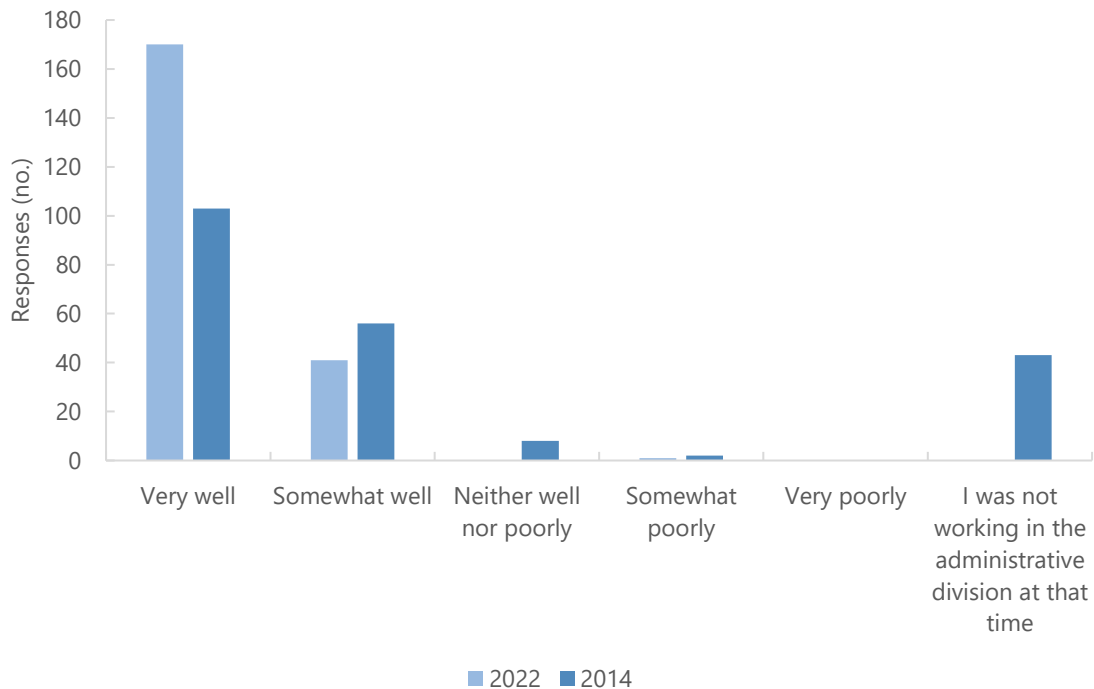
**Figure 3.1. Agricultural Extension Officers’ Satisfaction with Support from RAB and NAEB**



Source: Independent Evaluation Group.

Note: NAEB = National Agricultural Export Development Board; RAB = Rwanda Agriculture and Animal Resources Development Board.

**Figure 3.2. Agricultural Extension Officers' Self-Rating on Performance in Imihigo, 2022 Compared with 2014**

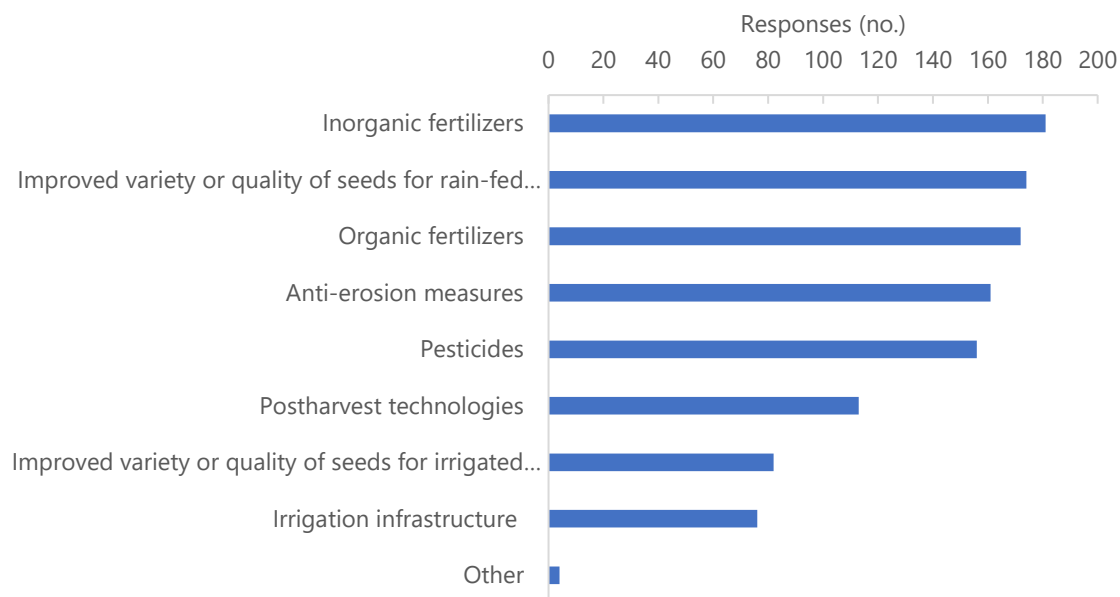


Source: Independent Evaluation Group.

Note: Imihigo is a system of performance contracts used at all levels of government to increase accountability and transparency during the planning and reporting phases of civil services. Each local government administrative unit determines its own objectives (with measurable indicators), considering national priorities as highlighted in the national and international policy and strategy documents.

3.13 PforR 1 supported the government’s Crop Intensification Program to enhance technology adoption by agricultural households. This program aimed to increase agricultural productivity by combining land use consolidation with efforts to stimulate technological adoption through distributing agricultural inputs including chemical fertilizers and infrastructure for irrigation (Nilsson 2019). It was elaborated as program 1 of PSTA 3, which PforR 1 extensively supported, as described earlier in this section. According to the survey at the time of the PPAR, a wide range of new agricultural technologies (fertilizers, improved seeds for rain-fed lands, anti-erosion measures, pesticides, and postharvest facilities) were adopted by farmers. In particular, more than 80 percent of survey respondents responded that farmers had adopted inorganic and organic fertilizers and improved seeds for rain-fed lands (figure 3.3).

**Figure 3.3. New Agricultural Technologies Adopted by Farmers**



Source: Independent Evaluation Group.

3.14 The survey results at the time of the PPAR are in line with the results of the Crop Intensification Program Citizen’s Satisfaction Survey, which reported that 87 percent of farmers under the program were using inorganic fertilizers, and 97 percent were using organic fertilizers (Ndushabandi et al. 2018). Statistically significant impacts on crop yields resulted from adoption of irrigation, erosion control, and other technologies under a parallel World Bank–funded project that supported the government program (LWH; World Bank 2018a). The share of agricultural households using improved seeds, organic fertilizer, inorganic fertilizer, and pesticides all slightly increased, from 43.8 percent, 81 percent, 36.6 percent, and 25.3 percent, respectively, in 2017 to 44.6 percent, 83.7 percent, 39.1 percent, and 26.8 percent in 2020 (NISR 2021a).

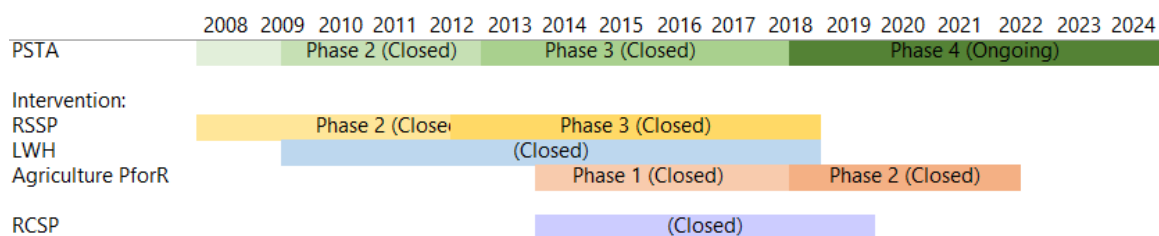
3.15 Knowledge and experience gained from implementation of PforR 1 was used effectively to design PforR 2. Stronger emphasis was given to value chain development in PforR 2, making it a more focused program than PforR 1. PforR 1 covered all four program areas that could spread resources that had upper limits. PforR 2 clearly stated its contributing areas under PSTA 4’s program at appraisal (World Bank 2018c). The independent results verification agency was changed from the Office of the Prime Minister in PforR 1 to the Office of the Auditor General in PforR 2. This enabled the Office of the Auditor General to accelerate the hiring of additional staff to conduct a technical audit in the agriculture sector (interview).

## 4. What Didn't Work and Why?

### Design and Preparation

4.1 Achievements by parallel projects funded by the World Bank and other development partners for expanding areas with terracing and irrigation systems were difficult to differentiate from achievements by PforR 1. PforR 1's DLIs on areas of land terraced and irrigated (DLIs 1 and 2) were aligned with the indicators in the Rural Sector Support Project (RSSP) Phase 3 and LWH, which were implemented almost simultaneously (figure 4.1). There is a valid line of inquiry as to whether the World Bank might have disbursed funds for the same result twice, once by funding the project implementation units and once by disbursing funds for DLI achievements through PforR 1 (Janus 2020). Still, the achievements of PforR 1 were reportedly significantly higher than the combined achievements of RSSP Phases 1–3 and LWH. For example, 20,712 hectares of land were irrigated under PforR 1 from FY12–13 to FY16–17 (World Bank 2019e); this was more than double the combined 9,852 hectares irrigated under RSSP Phases 1–3 from 2001 to 2018 (7,297 hectares) and under LWH from 2009 to 2018 (2,555 hectares; World Bank 2018b). In addition, the 185,107 hectares in the hillsides terraced under PforR 1 from FY12–13 to FY16–17 were more than six times the combined 27,694 hectares terraced under RSSP Phase 3 from 2012 to 2018 (9,312 hectares) and under LWH (18,382 hectares; World Bank 2019b, 2019e; Rwanda Agriculture and Animal Resources Development Board database). This analysis suggests a probable contribution from PforR 1 on top of what was done by the parallel projects, though further data would be required to support this argument.

**Figure 4.1. Development Partners' Interventions during the Transformation of Agriculture Sector Program**



Source: Independent Evaluation Group.

Note: LWH = Land Husbandry, Water Harvesting and Hillside Irrigation Project; PforR = Program-for-Results; PSTA = Transformation of Agriculture Sector Program; RCSP = Rural Community Support Project; RSSP = Rural Sector Support Project.

4.2 The sheer magnitude of the water, land, and soil challenges in Rwanda might have necessitated multiple projects that aimed to be synergistic. LWH was originally planned to be closed before PforR 1 began. After receiving additional financing totaling

\$106.07 million from the Global Agriculture and Food Security Program (\$50 million), the IDA (\$35 million), the United States Agency for International Development (\$13.27 million), and the Canadian International Development Agency (\$7.8 million), LWH was extended for four years (World Bank 2018b). The Korea International Cooperation Agency irrigated seven project sites in six districts,<sup>18</sup> including a marshland in Rwinkwavu near a marshland developed by the World Bank for a synergistic effect (interview).

4.3 Results for market-oriented infrastructure were not measured by the results framework of PforR 1. According to the results from the parallel projects that supported PSTA 3, postharvest facilities (warehouses, storage facilities, dryers, drying grounds, and collection centers for horticultural products and bananas) were constructed by the other two World Bank-funded projects (LWH and RSSP Phase 3) and the Korea International Cooperation Agency-funded Rural Community Support Project (MINAGRI 2017). Those postharvest facilities were constructed near the project sites for irrigation and soil control to reduce postharvest loss and improve postharvest management and agroprocessing (MINAGRI 2017). In 2010–17, 202 warehouses (with 295,495 metric tons of capacity) and 251 drying grounds were constructed (MINAGRI 2017). Another World Bank-funded project to build rural feeder roads (the Rwanda Feeder Roads Development Project), which was expected to contribute to PSTA 3 (World Bank 2014d), was delayed by approximately two years at initiation because of the World Bank’s prolonged document approval process and the transfer of implementation responsibility and budgets from the Ministry of Agriculture and Animal Resources to the Ministry of Infrastructure and the Rwanda Transport Development Agency (MINAGRI 2017, 2018a).

4.4 The reliability of data reported as achievements under PforR 1 was weak, raising questions regarding the adequacy of measuring and verifying the efficacy of PforR 1. Although a majority of disbursement-relevant results met or exceeded their targets (out of eight DLIs, five were achieved, two were partially achieved, and one was not achieved; see appendix E), there were persistent discrepancies in reported results and observations in the field. For example, the 1,082,153 hectares that were reportedly irrigated and terraced by the end of PforR 1, inclusive of the baseline values (World Bank 2019e), reached 93 percent of the total arable land of 1,151,700 hectares as of 2018 (World Bank DataBank), which was an unrealistically high achievement for a four-year operation. Similar data discrepancies were pointed out by Woelcke and Reichhuber’s (2017) independent review of the PforR and by academic research on the quality of agricultural data in Rwanda (Ansoms et al. 2018; Desiere, Staelens, and D’Haese 2016; Heinen 2021; Janus 2020). The data discrepancies could result from the following factors,



according to interviews by Janus (2020): (i) the lack of standardized methodology for collecting data on agricultural indicators in district planning documents; (ii) inadequate qualifications of district and sector agronomists to produce high-quality reporting for a wide variety of crops; (iii) high pressure on government officials to report good performance, even though reported numbers might be unrealistic. There is a persistent struggle over how to sample and measure multiple and difficult variables, especially when they depend on responses from farmers and public workers.

4.5 The centralized fund disbursement mechanism in public channels might not directly incentivize private financial institutions to increase agricultural lending to farmers. Views differ on what might have contributed to the discontinuation of DLI 5 after additional financing. The Ministry of Agriculture and Animal Resources stated regarding DLI 5 that “achieving the indicator was beyond the direct control of MINAGRI and it was dropped as a DLI” (MINAGRI 2018b). The Implementation Completion and Results Report for PforR 1, however, stated that DLI 5 was discontinued because “the Government of Rwanda (GoR) was satisfied with the results achieved up to year 3 of implementation” (World Bank 2019e). It is important to monitor this aspect in successor projects. In addition, the DLI did not capture the positive relationship between the land husbandry infrastructure and the financial behavior of the neighboring communities. Since 2008, *umurenge* (sector) SACCOs have been established in administrative sectors to boost rural savings and provide Rwandans with loans to improve their earnings and enhance their livelihoods.<sup>19</sup> The FinScope Rwanda 2020 survey reported that approximately 77 percent (5.5 million) of the adults in Rwanda have or use formal financial products and services, more than triple the 21 percent in 2008 (AFR 2020). Formal credit consumption has increased remarkably, driven by borrowing from SACCOs and mobile money, each with 9 percent penetration (AFR 2020). An interview with a SACCO located near the radical terraces and irrigation systems built under PSTA 3 confirmed that the SACCO increased the number of members and the amount of savings during PSTA 3, which enabled the SACCO to open two new branches to respond to the increased demand for financial services in the intervention area.

## Implementation and Supervision

4.6 There is insufficient evidence regarding the effectiveness of the advance disbursement instrument, particularly where there are gaps in human resources. During IEG’s interviews, multiple respondents from different institutions mentioned the persistent challenge of insufficient allocation and prolonged disbursement of funds from the Ministry of Finance and Economic Planning to the Ministry of Agriculture and Animal Resources due to limited human resources. The fund disbursement mechanism from the central treasury to the line ministry and affiliated institutions based on DLI

achievements may fail to reward key contributors if there are gaps in capacity and eligibility to request and execute budgets.

4.7 Increases in absolute expenditures on wages in the agriculture sector have not strengthened the technical capacities of the Ministry of Agriculture and Animal Resources to request and execute budgets. PforR 1 implemented an action plan in response to findings in Agriculture Public Expenditure Review 2016 (PAP 4.15; World Bank 2019e), which noted a relatively low recurrent expenditure in agriculture and a small and declining share of personnel costs and recommended studies to determine the optimum balance between administrative and development costs and between wage and nonwage costs (Nwoko et al. 2016). Before PforR 1, the government adopted a policy of low personnel costs, which was applied in PSTA 3, resulting in a small and declining share of personnel costs out of total expenditures. Wages as a share of recurrent expenditures declined from 17.5 percent in FY11–12 to 8.5 percent in FY15–16 (World Bank 2016). At program closing, the share of wages in recurrent expenditure rose sharply from 4.0 percent in FY16 to 12.6 percent in FY17 and 13.8 percent in FY18 because of increases in absolute expenditures on wages from FY17 (Nwoko et al. 2019). As noted in the previous paragraph, gaps in human resources have not been sufficiently addressed by the increases in absolute expenditures on wages in the agriculture sector.

4.8 The lack of comprehensive measurements of private sector and public-private partnership investments prevented further analysis of their contributions, which would be important to address underinvestment in agricultural research and technology transfer. The failure to measure these was caused by indicators that were insufficiently disaggregated by source of investment. There has been severe underinvestment in agricultural research and the extension system (World Bank 2016). Although 7.2 percent of the total PSTA 3 budget of \$1.2 billion was allocated to program 2 of PSTA 3, which addressed research, technology transfer, and professionalization of farmers, actual expenditures accounted for only 0.7 percent (World Bank 2016). According to the Agriculture Science and Technology Indicators by the International Food Policy Research Institute, Rwanda's agricultural research and development spending (excluding the private for-profit sector) decreased from \$39.9 million in 2014 to \$27.3 million in 2016 (in constant 2011 purchasing power parity dollars), which accounted for 0.76 percent and 0.44 percent, respectively, of the agriculture gross domestic product.<sup>20</sup> The decrease in agricultural research and development spending was associated with the decline of donor funding for research and development that the Rwanda Agriculture and Animal Resources Development Board mainly relies on to finance agricultural research and development (IFPRI and RAB 2018). PforR 1 aimed to develop and implement a strategy to secure long-term funding support for public-sector agricultural research (World Bank 2014d). However, to what extent the underinvestment

was addressed under PforR 1 was not measured well. PAP 1.1 developed a strategy that aimed to secure long-term funding support for public-sector agricultural research, with provision for eventual participation of the private sector in the funding, but completion of PAP actions was only briefly reported at program closing (World Bank 2019e). KPI 9 measured the total amount of money channeled into the agriculture sector by private investors (domestic and foreign) but did not differentiate the investment areas.<sup>21</sup>

4.9 The institutional capacity of water users' organizations was not developed to ensure sustainability after program closing. According to the survey of agricultural extension service officers in sectors and districts conducted for this PPAR, adoption of irrigation-related technologies was observed less among farmers than others (see appendix G for details). During IEG's interviews, respondents commented that the water users' organizations relied on the government to conduct major repairs of the irrigation systems but repaired minor damage and cleaned waterways with community support. The water fee collection procedures varied based on the capacity of staff members of the water users' organizations and their relationships with agricultural cooperatives.

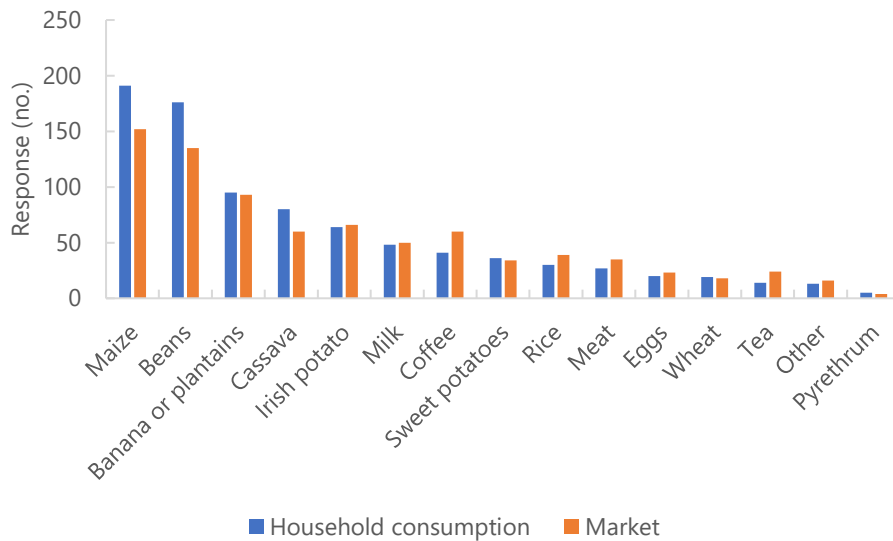
4.10 Findings from literature reviews align with IEG's findings at the time of the PPAR. According to an evaluation of budget support from the European Union to Rwanda's agriculture sector (2011–18), the newly constructed and rehabilitated irrigation systems did not always lead to the development of profitable and sustainable irrigated agriculture, partly because of the lack of farmers' participation and inadequate management and maintenance (GDSI 2020). Under LWH, funded by the World Bank, only a few farmers adopted the technology for hillside irrigation four years after its introduction because of failures in labor and land markets in Rwanda (Jones et al. 2019). With so few farmers using irrigation within the plan and benefiting from it, the gains in cash income could not cover maintenance costs (Jones et al. 2019).

4.11 Longer-term monitoring of results is needed to adequately observe outcomes related to food security and nutrition. As measured by PforR 1's results framework, the share of households with acceptable levels of food consumption decreased from the baseline of 79 percent in FY12–13 to 74 percent in FY14–15, not meeting the target of 81 percent (KPI 15; World Bank 2019e). No results for FY15–16 and FY16–17 were provided to compare with the target of 82 percent in FY16–17 (KPI 15; World Bank 2019e). The share of agricultural households with a kitchen garden decreased from 44.4 percent in 2017 to 36.3 percent in 2020 (NISR 2021a). The decrease might have been affected by the PforR 1 and LWH but also by various reasons beyond these interventions. According to the Rwanda country office's agriculture team, not all kitchen gardens that existed in the country in 2017 were constructed through LWH, and PforR 1 had no specific target about kitchen gardens being built in communities.

4.12 According to the national-level data on food security beyond PforR 1's results framework, households involved in the land use consolidation program and households practicing soil erosion control or irrigation were more likely to be food secure (WFP 2018). The food consumption scores of farmers practicing land use consolidation reached over 50, above the acceptable score of 35, because of the effects of land use consolidation on yield and extension services (Habyarimana and Nkunzimana 2017). According to the annual report for FY16–17 by the Ministry of Agriculture and Animal Resources, maize and beans stored as a strategic food reserve reached 117,401 metric tons in FY16–17, more than double the target of 45,000 metric tons (core indicator 20 of the Second Economic Development and Poverty Reduction Strategy Paper [2013–18]; MINAGRI 2017). However, the management of those reserves was not monitored, raising the question of to what extent the strategic food reserves contributed to food availability and access for the population. In 2018, 18.7 percent of households in Rwanda were food insecure (17.0 percent were moderately food insecure and 1.7 percent severely food insecure), which is not a significant change from the proportion in 2015 (WFP 2018).

4.13 There is insufficient evidence regarding whether PforR 1's development of value chains for agricultural products went beyond the local market level. The Rwanda country office's agriculture team indicated that between 2014 and 2018 there was increased capacity for processing and value addition for locally produced agricultural and livestock products, including rice, maize, horticultural products, and milk. According to the survey at the time of this PPAR, however, the five most important crops for farmers are the same for both household consumption and sale: in descending order, maize, beans, bananas or plantains, cassava, and Irish potato (figure 4.2). Coffee and tea, the two well-known export commodities of Rwanda, are ranked 7th and 13th in importance out of 15 crops and livestock products. These data imply that the farmers mainly produce crops for consumption within their local or neighboring communities, not for sale in a larger-scale value chain across the country or beyond its borders.

**Figure 4.2. Important Crops and Livestock Products for Household Consumption and Marketing**



Source: Independent Evaluation Group.

4.14 The findings from IEG’s mission for the PPAR on expansion of value chain development are in line with data from an external source. According to the Comprehensive Food Security and Vulnerability Analysis in 2018, 53–61 percent of food consumed by the farming households (low, medium, or high-income agriculturalists and agropastoralists) came from the market, more than the share that came from their own production (37–45 percent; WFP 2018). Farming households rely on local markets to purchase crops for household consumption.

## 5. Lessons

5.1 PforRs should start with relatively mature and ready-to-implement activities, in this case including soil erosion control and enhanced technological innovation, which led to early results in land husbandry and increased agricultural productivity. It is important to start with a program with a geographically or thematically narrow and simple scope, which would allow institutions and systems to adapt over time and strengthen the preparation for highly relevant PforR-related processes, such as the monitoring and evaluation system and the DLI verification process. An intervention involving a multisector or multilevel approach covering several geographic regions is difficult to implement, particularly with many indicators and PAPs to be managed through interagency collaboration. Designs initially should be kept simple for eventual scale-up and include close coordination among the central-, district-, and sector-level authorities so that learning opportunities are used to attain stronger institutional and managerial capacity for similar operations. A PforR operation trying to address at once

almost all constraints for commercialization of farmers (production intensification, research and technology transfer, private sector-led value chain development, market-oriented infrastructure, agricultural finance, institutional strengthening) may not achieve substantial results in all areas.

5.2 Incentivizing institutional reforms is an added value of the PforR instrument that needs to be internalized by all stakeholders across sectors and at both national and subnational levels. PforR operations often horizontally support large and complex government programs. In a sector that faces challenges at different levels, there may be parallel projects by development partners that aim to contribute to the same envisioned outcome of the government program. When compared with the World Bank's two investment project financing projects implemented at almost the same time, the strength of the PforR instrument is its potential to contribute to institutional strengthening and reforms. It is important to ensure that stakeholders across sectors and administrative levels are aware of the current systems or their common practices and behaviors and are willing to change them. Explicitly including an institutional strengthening objective in a PDO statement and preparing a solid TOC can highlight key activities that are expected to trigger reform processes.

5.3 Any gaps in capacity and eligibility to request and execute budgets need to be addressed first to ensure the effective functioning of the fund disbursement mechanism—based on DLI achievements—from the central treasury to the line ministry and affiliated institutions. The evaluation team received comments from multiple sources that indicated limited human resources, especially at the technical level, were associated with the Ministry of Agriculture and Animal Resources' challenges in securing sufficient allocation and timely disbursement of funds from the Ministry of Finance and Economic Planning (interview). Stakeholders in the implementing agencies considered implementation of the PforR instrument more labor intensive than other World Bank financing instruments. Allocating adequate staff time and financial resources to implement and report activities and coordinate with cross-sectoral stakeholders is important for the success of PforR operations. In addition, the centralized fund disbursement mechanism in public channels might not directly incentivize private financial institutions to increase agricultural lending to farmers, affecting the discontinuation of DLI 5 after additional financing. Fund disbursement mechanisms and DLIs must be carefully designed to provide adequate incentives to key drivers to achieve the envisioned results.

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<sup>1</sup> World Bank Data (database; accessed June 10, 2022), <https://data.worldbank.org/indicator>.



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<sup>2</sup> The population projections are based on the Fourth Population and Housing Census 2012, which is the latest population and housing census.

<sup>9</sup> Although the baseline of disbursement-linked indicator 4 (key performance indicator 5) was set as five technologies, the Program Appraisal Document of Program for Results 1 included six crops in a footnote to the baseline: “Maize, beans, cassava, rice, wheat, and soybean” (World Bank 2014d, 56n41).

<sup>10</sup> Technology innovations refer to improved or new methods or practices of production (internationally or nationally generated), including more efficient input usage that led to increased productivity (for example, new or improved varieties of crops introduced and released, improved breeds of livestock, improved input usage such as improved seed varieties and fertilizers; World Bank 2014e).

<sup>11</sup> Adoption rate refers to farmers who adopt these improved or new innovations and those introduced two years previously to account for the lag in adoption rates (World Bank 2014e).

<sup>12</sup> Detailed descriptions of the 20 technologies were not provided in available documents.

<sup>13</sup> The methodology for measuring program development objective indicator 1 was modified during implementation as described in the aide-mémoire of the third Implementation Support Mission from March 2016. First, concerning the categories of technologies considered, irrigation and soil erosion control measures were included (in addition to improved seeds, fertilizer, and mechanization) and differential weights were used to arrive at a composite index. Second, the percentage of agricultural land covered by these technologies was used as opposed to their adoption by percentage of farm families.

<sup>14</sup> The actual and target values for fiscal years 2016–17 were not provided.

<sup>15</sup> African Union Development Agency (website; accessed August 4, 2022), <https://www.nepad.org/caadp/countries/rwanda>.

<sup>16</sup> Through the Land Husbandry, Water Harvesting and Hillside Irrigation Project (P114931 2009–18), which included component C: implementation through the ministerial sectorwide approach structure.

<sup>17</sup> Rwanda Development Partners (website; accessed June 9, 2022), <http://www.devpartners.gov.rw/index.php?id=19>.

<sup>18</sup> Through the Rural Community Support Project (2011–19).

<sup>19</sup> Rwanda Cooperative Agency (website; accessed January 10, 2023), <https://www.rca.gov.rw/cooperatives/about-saccos>.

<sup>20</sup> The country profile for Rwanda on the website of the Agricultural Science and Technology Indicators facilitated by the International Food Policy Research Institute (accessed July 15, 2022), <https://www.asti.cgiar.org/rwanda>.

<sup>21</sup> In the Agriculture Sector Investment Plan, the investment areas were expected to cover agriculture and animal resource intensification, research and technology transfer, value chain development, and private sector investment (World Bank 2014d).

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# Appendix A. Ratings

## Transformation of Agriculture Sector Program Phase 3 Program-for-Results (P148927)

Table A.1. ICR, ICR Review, and PPAR Ratings

Indicator	ICR	ICR Review	PPAR
Outcome	Moderately satisfactory	Moderately satisfactory	Moderately satisfactory
Bank performance	Moderately satisfactory	Moderately satisfactory	Moderately satisfactory
Quality of monitoring and evaluation	Modest	Substantial	Modest

Sources: World Bank 2019, 2021.

Note: The ICR is a self-evaluation by the responsible Global Practice. The ICR Review is an intermediate Independent Evaluation Group product that seeks to independently validate the findings of the ICR. ICR = Implementation Completion and Results Report; PPAR = Project Performance Assessment Report.

### 1. Relevance of the Objectives

#### Objectives

The program development objective (PDO) of the Transformation of Agriculture Sector Program Phase 3 Program-for-Results (PforR 1) was “to increase and intensify the productivity of the Rwandan agricultural and livestock sectors and expand the development of value chains” (World Bank 2014a, 4). The formulation of the PDO was identical between the financing agreement and the Program Appraisal Document (World Bank 2014a, 2014b).

This PDO was not revised during implementation and is hence adopted for this Project Performance Assessment Report (PPAR), which will assess the following three objectives:

**Objective 1:** To increase and intensify the productivity of the Rwandan agricultural and livestock sectors

**Objective 2:** To expand the development of value chains

**Objective 3:** To strengthen the institutional capacity

This PPAR concurs with the Implementation Completion and Results Report (ICR) Review that one of the objectives of PforR operations is to strengthen a country’s institutional capacity, even if this is not explicit in the PDO statement (World Bank 2021). This PPAR also concurs with the ICR that improving institutional capacity and

program systems was an implicit objective of PforR 1 (World Bank 2019). It is therefore important to assess whether and how improved institutional capacity, systems, and procedures contributed to improved efficacy.

## **Relevance of the Objectives**

**Country and sector context.** Rwanda is a small landlocked country covering 24,670 square kilometers, of which 73.4 percent is agricultural land.<sup>22</sup> Because 85 percent of the land mass is hilly terrain (World Bank 2014b), most of the agricultural land is located on slopes. It is one of the most densely populated countries in Africa and is projected to have a population of 13.2 million, with 524 inhabitants per square kilometer, in 2022 under the medium scenario (NISR and MINECOFIN 2014).<sup>23</sup> Of all its workforces, 66 percent work on farms as either independent farmers (51 percent) or wage workers (15 percent; NISR 2021b). Rwanda reduced poverty from 60.3 percent in 2001 to 38.2 percent in 2017 (MINECOFIN 2002; NISR 2018). Increases in agriculture production and commercialization were the key drivers of poverty reduction and accounted for more than 45 percent of the total (World Bank 2014b). Rwanda's agricultural transformation aimed (i) to transform Rwandan agriculture from a subsistence sector to a knowledge-based, value-creating sector; and (ii) to grow the sector as rapidly as possible, in relation to both production and commercialization, to increase rural incomes and reduce poverty (MINAGRI 2013). To support such agricultural transformation, the Ministry of Agriculture and Animal Resources has launched four phases of the Transformation of Agriculture Sector Program since 2004. PforR 1 was designed to support the government to implement the Third Phase of the Transformation of Agriculture Sector Program (known by its French acronym, PSTA 3).

**Relevance to government strategies.** At appraisal, the objectives were aligned with Rwanda's strategic document, Rwanda Vision 2020, and the related Second Economic Development and Poverty Reduction Strategy Paper (2013–18). At program closing, the objectives were aligned with the two strategies above and the follow-on strategies, including Rwanda Vision 2050 and the National Strategies for Transformation (2017–24).

**Relevance to World Bank assistance strategies.** At appraisal and program closing, the objectives were aligned with the Country Partnership Strategy (CPS) for fiscal years (FY)14–18, which included CPS objective 5 (improved agriculture productivity and sustainability), CPS objective 6 (improved access of rural/small farmers to inputs, financing, and markets), and CPS objective 7 (improved agriculture value chains). At the time of this PPAR, the objectives were aligned with the Country Partnership Framework for FY21–26, which highlights the importance of the sector modernizing, being responsive to market signals, and integrating with regional and global markets more effectively (World Bank 2020, para. 40). Country Partnership Framework objective 4



(increased agricultural productivity and commercialization) relates most strongly with the activities supported by PforR 1 and emphasizes their continued relevance for Rwanda's agriculture sector growth. Also, the PforR instrument was relevant to addressing market failures and driving the aspired sector reforms on agribusiness highlighted in the Country Partnership Framework (World Bank 2020, para. 78), such as increased agrifinance (World Bank 2020, para. 99) and value addition and market orientation of agriculture production (World Bank 2020, para. 40).

**Prior sector experience.** The World Bank has been supporting the agriculture sector in Rwanda since the first phase of the PSTA (2004–08).

The objectives were aligned with the strategies of the government and the World Bank's development assistance. Overall, the relevance of objectives is rated **high**.

### **Disbursement-Linked Indicators**

**Original disbursement-linked indicators (DLIs).** There were seven DLIs, as summarized in table A.2. The largest fund allocations of 30 percent as share of the total International Development Association credit were provided to a combination of DLIs related to the construction of infrastructure (DLI 1 on progressive and radical terraces and DLI 2 on irrigation) and a combination of DLIs related to institutional capacity strengthening (DLI 6 on deployment of a monitoring information system and DLI 7 on policies for seeds, fertilizer, and agricultural finance). DLI 3 related to increases in average crop yields and productivity for key food crops, export commodities, and livestock products. DLI 4 related to technologies disseminated by public or private institutions, or both, and adopted by farmers and aimed for a higher level of results than DLI 1 and DLI 2. DLI 5, which was related to an increase in agricultural finance lending, measured results in which private institutions were the main actors for generating the results.

**Table A.2. Original Disbursement-Linked Indicators and Their Allocation as Share of Total International Development Association Credit (percent)**

DLI	DLI Allocation as Share of Total IDA Credit <sup>a</sup>
DLI 1: Annual increases in terraced land area (progressive and radical), based on agreed technical standards	20
DLI 2: Annual increases of irrigated area in marshlands and hillsides, based on agreed technical standards, with adequate O&M	10
DLI 3: Increases in average crop yields and productivity for key food crop, export commodity, and livestock product—cassava, coffee, and milk	15
DLI 4: Number of innovation technologies introduced and released by public and/or private sectors, and adopted by farmers	15
DLI 5: Increase in agricultural finance lending for agriculture sector (production and agroprocessing)	10
DLI 6: Enhanced gender-sensitive MIS framework and action plan for agricultural sector completed, approved, initiated, and fully operational	10
DLI 7: Approval of seeds, fertilizer, and agricultural finance policies, and preparation and initial implementation of action plan	20
Total	100

Source: World Bank 2014b.

Note: DLI = disbursement-linked indicator; IDA = International Development Association; MIS = management information system; O&M = operation and maintenance; PforR 1 = Transformation of Agriculture Sector Program Phase 3 Program-for-Results.

a. At appraisal, the funding from other development partners who participated in supporting PforR 1 was understood to be allocated to the same DLIs, according to a similar pattern of distribution, in agreement with the Common Framework of Engagement of the Multi-Donor Trust Fund (World Bank 2014b).

**Revised DLIs.** DLI 5 was dropped at the restructuring in 2017 because achieving the indicator was beyond the direct control of the Ministry of Agriculture and Animal Resources (MINAGRI 2018). The targets of all the remaining DLIs were increased in accordance with the increased allocations from additional financing (table A.3). DLI 7 was revised to replace the agriculture finance policy with the agriculture finance strategy and the diagnostic report approved by the Agriculture Sector Working Group (MINAGRI 2018). DLI 8 was added to update the National Agriculture Policy of 2004.

**Table A.3. Revised Disbursement-Linked Indicators and Their Allocation as Share of Total International Development Association Credit and Multidonor Trust Fund Grants (percent)**

DLI	DLI Allocation as Share of Total IDA Credit and MDTF Grants
DLI 1: Annual increases in terraced land area (progressive and radical), based on agreed technical standards.	20
DLI 2: Annual increases of irrigated area in marshlands and hillsides, based on agreed technical standards, with adequate O&M.	10
DLI 3: Increases in average crop yields and productivity for key food crop, export commodity, and livestock product—cassava, coffee, and milk.	15
DLI 4: Number of innovation technologies introduced and released by public and/or private sectors, and adopted by farmers.	15
DLI 5: Increase in agricultural finance lending for agriculture sector (production and agroprocessing).	7
DLI 6: Enhanced gender-sensitive MIS framework and action plan for agricultural sector completed, approved, initiated, and fully operational.	10
DLI 7: Approval of seeds and fertilizer policies, agricultural finance strategy, and agricultural finance diagnostic report, and preparation and initial implementation of action plan.	20
DLI 8: Extent to which an updated National Agricultural Policy has been approved. Action plan prepared and approved.	3
Total	100

Source: MINAGRI 2018; World Bank 2019.

Note: DLI = disbursement-linked indicator; IDA = International Development Association; MDTF = multidonor trust fund; MIS = management information system; O&M = operation and maintenance.

## Relevance of the DLIs

The DLIs are well aligned with PSTA 3’s programs and subprograms, but most DLIs focused on output-level results. DLI 5 on agricultural finance lending was not adequately designed to provide incentives because the main stakeholders to contribute to the results were private entities, not the public institutions that the implementing agencies can directly influence. Overall, the relevance of the DLIs is rated **substantial**.

## 2. Efficacy

### Objective 1: To increase and intensify the productivity of the Rwandan agricultural and livestock sectors

**Theory of change.** Objective 1’s theory of change envisioned that activities including constructing terraces and irrigation systems, conducting research on agricultural technologies, providing training to farmers to use new agricultural technologies, and organizing agricultural cooperatives would result in outputs such as increased agricultural lands with soil and water conservation measures, more farmers who

adopted new agricultural technologies, and improved service delivery of agricultural cooperatives, contributing to outcomes including increased yields of major crops and livestock products and increased production and export values of agricultural products.

The area with soil erosion control increased from the baseline of 848,538 hectares in FY12–13 to 1,033,645 hectares in FY16–17, exceeding the target of 1,023,479 hectares (DLI 1, key performance indicator [KPI] 1; World Bank 2019). Irrigated lands increased from the baseline of 27,796 hectares in FY12–13 to 48,508 hectares in FY16–17, exceeding the target of 44,500 hectares (DLI 2, KPI 2; World Bank 2019). At the time of the PPAR, the number of agricultural households that use soil erosion control measures and irrigation practices was expanding. According to the Agricultural Household Survey 2020, the share of agricultural households that use erosion control measures and irrigation practices increased from 65.7 and 10.1 percent, respectively, in 2017 to 83.8 and 14.6 percent in 2020 (NISR 2021a).

The number of enhanced technology innovations introduced by the public or private sector, or both, and the farmers' adoption rate increased from the baseline of 5 technologies and 25 percent in FY12–13 to an additional 20 technologies and 54.5 percent in FY16–17, meeting the targets of an additional 16 technologies but not meeting the target adoption rate of 70 percent (DLI 4, KPI 5; World Bank 2019). The share of agricultural land under modernized agricultural technologies increased from the baseline of 19 percent to 31 percent, which came close to meeting the target of 34 percent (PDO indicator 1) because the methodology for measuring PDO indicator 1 was modified during implementation to include irrigation and soil erosion control measures in the categories of technologies (in addition to improved seeds, fertilizer, and mechanization; World Bank 2016, 2019). At the time of the PPAR, farm families' technology adoption rates show a possibility of sustained results. The share of agricultural households using improved seeds, organic fertilizer, inorganic fertilizer, and pesticides all slightly increased from 43.8 percent, 81 percent, 36.6 percent, and 25.3 percent, respectively, in 2017 to 44.6 percent, 83.7 percent, 39.1 percent, and 26.8 percent in 2020 (NISR 2021a). The share of agricultural households producing cassava increased from 26.9 percent in 2017 to 45.7 percent in 2020 (NISR 2021a). The share of agricultural households with at least one member receiving an agricultural extension was 65 percent in 2020 (NISR 2021a).

Organizing agricultural cooperatives is widely observed as institutional strengthening among farmers, as indicated by 94 percent of respondents to question 9 of the survey of agricultural extension officers indicated (see appendix G), followed by increasing women's participation in local groups (59 percent; table A.4). The agricultural cooperatives served as a channel through which farmers purchased agricultural inputs, sold crop yields, and accessed informal agricultural finance.

**Table A.4. Institutional Strengthening Observed among Farmers**

<b>Institutional Strengthening</b>	<b>Responses (no.)</b>	<b>Respondents (% of total)</b>
What were the institutional strengthening among farmers that were observed? Choose all that apply.		
Organizing agricultural cooperatives	197	94
Increasing women’s participation in local groups	124	59
Organizing maintenance of facilities and equipment	89	43
Organizing water users’ associations	83	40
Other	12	6
<b>Total<sup>a</sup></b>	<b>505</b>	

Source: Independent Evaluation Group.

a. 209 survey respondents answered this question.

The results from soil erosion control, irrigation, and technology adoption described earlier in this section contributed to increasing the productivity of the agriculture sector (the first objective in the PDO). Statistically significant impacts on crop yields resulted from adoption of irrigation, erosion control, and other technologies under a parallel World Bank–funded project (Land Husbandry, Water Harvesting and Hillside Irrigation Project; World Bank 2018). The average productivity levels of major food and export crops (cassava and coffee) and a livestock commodity (milk) increased from the baseline of 15 tons per hectare, 2.2 kilograms per tree per year, and 4 liters per cow per day, respectively, in FY12–13 to 19 tons per hectare, 2.8 kilograms per tree per year, and 6.3 liters per cow per day in FY16–17 (DLI 3, KPI 3; World Bank 2019). The targets for cassava (19 tons per hectare) and milk (6.21 liters per cow per day) were fully met, and that for coffee (2.9 kilograms per tree per year) was almost met (DLI 3, KPI 3; World Bank 2019). Considering that the 2016 drought resulted in low crop yields from September 2015 to January 2017 (NISR 2018), the increases in the average productivity levels of major food and export crops and livestock commodity under the natural disaster suggested strengthened resilience of the agriculture and livestock sector in Rwanda.

Overall, the achievement of objective 1 is rated **substantial**.

### **Objective 2: To expand the development of value chains**

**Theory of change.** Objective 2’s theory of change envisioned that activities including building market-oriented infrastructure (feeder roads, markets, processing and postharvesting facilities, and milk collection centers) and providing training on value chain development to relevant stakeholders would result in outputs such as increased market-oriented infrastructure and increased lending to farmers and private entities to make agricultural investments, contributing to outcomes such as enhanced value chains

with active participation of farmers and private entities, and increased commercialization of agricultural and livestock products.

At appraisal, market-oriented infrastructure to expand value chain development (including feeder roads, markets, processing and postharvesting facilities, and milk collection centers) was expected to be constructed by the parallel projects funded by the World Bank, the other development partners, and the government itself. The initiation of the feeder roads project supported by the World Bank was delayed, however, because the feeder roads for value chain development could not be built as originally planned.

The total production value and export value of major competitive value chains were increased from the baselines of \$2.3 billion and \$132 million, respectively, in FY12–13 to \$2.873 billion and \$356.5 million in FY16–17 (KPI 7; World Bank 2019). The actual export value met the target of \$309 million (KPI 7; World Bank 2019). Private sector investments in the agriculture sector (domestic and foreign) were increased from the baseline of \$513 million to \$758.5 million, meeting the target of \$730 million (KPI 9; World Bank 2019). No target value, however, was set for total production value in FY16–17 (KPI 7; World Bank 2019). Considering that the price of food was relatively high in FY16–17 because of a bad harvest caused by the 2016 drought (NISR 2018), it is difficult to articulate to what extent the increase in the actual total production value was attributable to developments in value chains. The share of agricultural production marketed increased from the baseline of 21 percent in FY12–13 to 23 percent in FY16–17, not meeting the target of 25 percent (KPI 10; World Bank 2019). The share of agricultural households with at least one member belonging to an agricultural cooperative or association was 12.5 percent in 2020, which had not changed from 2017 (NISR 2021a).

The partial achievement of the private sector value chain development results, which was described in the previous paragraph, negatively affected an expansion of the development of value chains (the second objective in the PDO). The share of agriculture exports slightly increased from the baseline of 22 percent in FY12–13 to 23 percent in FY16–17, not meeting the target of 25 percent in FY16–17 (PDO indicator 2; World Bank 2019).

Overall, the achievement of objective 2 is rated **modest**.

### **Objective 3: To strengthen the institutional capacity**

**Theory of change.** Objective 3's theory of change envisioned that activities including developing the National Agriculture Policy and the strategies for two subsidiary institutions of the Ministry of Agriculture and Animal Resources (the Rwanda Agriculture and Animal Resources Development Board and the National Agricultural Export Development Board); developing and rolling out the agriculture management

information system (MIS) to all 30 districts; and providing training for fiduciary, environmental, and social aspects to the government institutions at the central and district levels would result in outputs such as strengthened institutional capacity of the government institutions, contributing to outcomes such as enhancements in enabling the environment for privatization and decentralization of the sector, an improved business environment, results-focused decision-making processes, and value chain development.

Capacity development of the government institutions in the agriculture sector was incorporated in results-based disbursement conditions that were met under PforR 1. The MIS was rolled out in 30 districts, producing regular reports that included monitoring indicators of the operation and maintenance of rural infrastructure (DLI 6, KPI 12, and Program Action Plan [PAP] 3.2; World Bank 2019). The report on seeds, fertilizers, and agriculture finance was integrated into the National Agriculture Policy, which was approved by the Agriculture Sector Working Group in June 2017 (DLI 7, DLI 8, and KPI 13; World Bank 2019). Farmers' access to new agricultural inputs, including improved seeds and fertilizers, was enhanced by PforR 1, which contributed to the agricultural policy reform by developing the National Agriculture Policy, which covers distributions of improved seeds and fertilizers. Strategies for the Rwanda Agriculture and Animal Resources Development Board and the National Agricultural Export Development Board were approved (PAP 1.1; World Bank 2019). The position paper on strategic public-private partnerships to pursue in the sector was prepared by the Ministry of Agriculture and Animal Resources (PAP 1.2; World Bank 2019). A capacity development action plan for districts was prepared, and key milestones of the action plan were implemented (KPI 11; World Bank 2019). Capacity development training for fiduciary, environmental, and social aspects was conducted at the central and district levels (World Bank 2019).

The institutional capacity of farmers' organizations (agricultural cooperatives and water users' organizations), however, could not ensure sustainability after program closing. According to an evaluation of the budget support from the European Union to Rwanda's agriculture sector (2011–18), the newly constructed and rehabilitated irrigation systems did not always lead to the development of profitable and sustainable irrigated agriculture, partly because of the lack of farmer participation and inadequate management and maintenance (GDSI 2020). Under the Land Husbandry, Water Harvesting and Hillside Irrigation Project funded by the World Bank, only a few farmers had adopted the technology for hillside irrigation four years after its introduction because of failures in labor and land markets in Rwanda (Jones et al. 2019). With so few farmers using irrigation within the plan and benefiting from it, the gains in cash income could not cover maintenance costs (Jones et al. 2019). Those findings from literature reviews align with the results of the survey by the Independent Evaluation Group (IEG)



with agricultural extension service officers at the time of the PPAR. Adoption of irrigation-related technologies was observed less among farmers than others. The lack of financial resources was mentioned most as a main reason of farmers not adopting new technologies.

The institutional capacity of the Ministry of Agriculture and Animal Resources and the affiliated institutions was substantially strengthened, though that of farmers' organizations was modestly strengthened. Overall, the achievement of objective 3 is rated at the lower end of **substantial**.

### Overall Efficacy

Two objectives are rated substantial, though one of them is at the lower end. One objective is rated modest. Overall, the efficacy is rated **substantial**.

### 3. Outcome

The relevance of objectives is rated high. The relevance of DLIs is rated substantial. The efficacy is rated substantial. Overall, the outcome is rated **moderately satisfactory**.

### 4. Risk to Development Outcome

The ICR Review listed five risks based on the evidence provided in the ICR (World Bank 2019, 2021). Some of them are listed below with additional evidence.

**Environmental risk.** Rwanda is increasingly exposed to environmental changes because of climate change, in particular droughts, which could undermine the accomplishments of soil protection and productivity. In the survey, some agriculture extension service officers mentioned climate change as one of the reasons that farmers would not adopt new agricultural technologies. To mitigate the risk, activities to plant trees on hillsides were conducted by the government and other development partners.

**Economic risk.** There is a continuous risk of fluctuating food prices, being affected by international export markets and exposure to natural disasters. This can adversely affect the sector agents at all levels (from agribusinesses to smallholder producers) and private sector development in export-oriented crop production. The risk for smallholder producers can be mitigated by the government's insurance program. During the IEG team's interviews, a majority of interviewees in the field mentioned that PSTA 3 (the government program supported by PforR 1) contributed to the farmers earning money to enroll in the insurance program. Moreover, the increase in agricultural lending measured in DLI 5 can provide farmers with means to cope during unexpected food price fluctuations.

**Financial risk.** Irrigation systems require sufficient financial and human resources for effective operation and maintenance to ensure improved productivity levels. Resource limitations for operation and maintenance remain and can negatively affect agricultural production and productivity (World Bank 2019). The risk can be mitigated by strengthening of water users' organizations by the regulatory framework. Management structures that align with the local context were observed during the IEG team's field visits and in interviews, such as collecting water fees through agriculture cooperatives and savings and credit cooperatives and imposing fines for not attending community services to maintain and clean irrigation channels (interview).

## 5. Bank Performance

### Quality at Entry

The strategic relevance and approach were adequate. Using the PforR lending instrument for the first time in the agriculture sector in Rwanda was appropriate, considering the World Bank's prior sector experience in supporting the government's agriculture sector program from the first phase with investment project financing lending instruments. The policy aspects were well considered to respond to the needs to strengthen the policy framework for seeds, fertilizers, and agricultural finance. The government commitment was demonstrated by its contribution of \$300 million (25 percent of the PforR 1 costs). Technical, fiduciary, and environmental and social aspects were thoroughly assessed by the respective assessments at appraisal (World Bank 2014b). The findings of the assessments were reflected in the design of an Integrated Risk Assessment and PAP (World Bank 2019). PforR 1, however, did not strategically design a sequence of activities to first strengthen the institutional capacities of the government agencies to monitor and verify the results. Strengthening the institutional capacities on fiduciary management and monitoring and evaluation (M&E) of the Rwanda Agriculture and Animal Resources Development Board and the National Agricultural Export Development Board was conducted under the PAP concurrently with the implementation of DLI activities. The M&E arrangements had some shortcomings as described in section 6 of this appendix.

Overall, the quality at entry is rated **moderately satisfactory**.

### Quality of Supervision

The candor and quality of performance reporting were adequate to report delays and emerging needs. The supervision inputs and processes were generally adequate. Given the novelty of the PforR instrument for both the World Bank task team and the client, the World Bank task team was flexible and responsive in addressing emerging needs by using the restructuring and the additional financing (World Bank 2019). The task team

was proactive and benefited from its good relations with the government and development partners to create additional activities related to the PforR 1, such as the addition of the National Agriculture Policy as a DLI or the development of an Agriculture Public Expenditure Review for Rwanda (World Bank 2019). But the delays in the completion of PAP actions and the progress in private sector-related outcomes were addressed late (World Bank 2019). The focus on development impact was not fully adequate. The supervision did not use the PforR instrument to its full potential to stimulate a timelier government response to those delays and broader reform, which would have increased the potential impact of the program (World Bank 2021). The IEG team's interviews revealed that the added value of PforR 1 compared with the projects implemented concurrently with support from the World Bank and other development partners was not clearly recognized by the implementing agencies and the beneficiaries.

Overall, the quality of supervision is rated **moderately satisfactory**.

Based on moderately satisfactory ratings for both at entry and supervision, the Bank performance is rated **moderately satisfactory**.

## 6. Quality of M&E

### Design

The objectives of PforR 1 were clearly specified. The theory of change for objective 1 was sound and reflected the results framework, but that for objective 2 was not comprehensive enough to cover essential activities to induce causal changes to achieve the intended result. Food security and women's empowerment captured in the KPIs were not causally integrated into the theory of change. The PDO indicators were not adequate to encompass all three outcomes of the PDO. For the implicit objective 3 on institutional capacity building, a DLI to incentivize the use of M&E results in policy decision-making could have been considered (World Bank 2021). The M&E design and arrangements were not institutionally embedded. The technical assistance facility of the United Kingdom's Foreign, Commonwealth and Development Office directly operated the MIS until the end of the project in 2020, which limited the level of ownership of the system by the ministry and its long-term sustainability (FCDO 2020). Although the DLI verification protocol outlined in the Program Appraisal Document was clear and robust (World Bank 2014b), the implementation arrangement of the results verification process was not adequate. The Office of the Prime Minister faced challenges of insufficient budget and human resource capacity for the verification process because it is not a core mandate of the office (World Bank 2019).

## Implementation

All the indicators in the results framework were regularly measured and reported. Almost all baselines and targets were set for indicators in the results framework, except for those for production value in KPI 7. The MIS and the M&E framework for PSTA 3 were developed and rolled out to districts with 52 gender-disaggregated indicators (MINAGRI 2017), achieving DLI 6 (KPI 12). Training on the MIS was conducted for staff in the ministry and affiliated institutions and for directors of agriculture in all the districts (MINAGRI 2017). The MIS became the main source of data to monitor Imihigo (a system of performance contracts used at all levels of government to increase accountability and transparency) and annual plans (FCDO 2020). The targets and results, however, were not gender disaggregated as planned for DLI 4 (KPI 5) and DLI 5 (KPI 8). The M&E implementation revealed that the harmonization between national and subnational M&E data required further work (World Bank 2019). Moreover, the use of MIS for results-based policy making has not been observed (World Bank 2021).

## Use

M&E data were used as a decision-making tool during implementation and for disbursing against the DLIs during implementation (World Bank 2019). The ICR highlighted that the M&E results were incorporated in the design of PforR 2, in particular for a better-defined focus on private sector development (World Bank 2019).

Some weakness in the design of M&E and results verification affected the implementation and use of M&E data. The sustainability of the MIS after program closing to be used for results-based policy making is uncertain. Overall, the quality of M&E is rated **modest**.

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<sup>22</sup> World Bank Data (database; accessed June 10, 2022), <https://data.worldbank.org/indicator>.

<sup>23</sup> The population projections are based on the Fourth Population and Housing Census 2012, which is the latest population and housing census.

## **Appendix B. Fiduciary, Environmental, and Social Aspects**

Program-for-Results projects use government systems for their implementation, unlike investment project financing operations. During program preparation, the World Bank assessed the program in relation to technical, fiduciary, and environmental and social impacts to suggest recurring actions to strengthen the government system. The assessments informed the design of the Program Action Plan (PAP).

Of the 25 actions in the PAP, 23 actions were reported as completed in the Ministry of Agriculture and Animal Resources' implementation completion report. The two incomplete actions were PAP 4.2 (provide on-the-job training to district accounting staff focusing on the consolidation of nonbudget agencies at district level), which was reported as being dropped and taken up by the Ministry of Economic Planning and Finance, and PAP 4.14 (undertake institutional analysis of key units and delivery agencies including the Rwanda Agriculture and Animal Resources Development Board), for which progress was not reported (MINAGRI 2018, annex 8, 57–62).

### **Financial Management**

The following actions to strengthen financial management aspects were reported as completed: PAP 4.1 (prepare an operational action plan to address and strengthen relevant fiduciary aspects, with an emphasis on district-level capacities), PAP 4.3 (assess the risk prone areas of the program at the district level and develop a risk profile to be monitored through the program life ensuring that timely mitigation measures are undertaken), PAP 4.4 (reconcile the accounting/financial statements before and after merger of both the Rwanda Agriculture and Animal Resources Development Board and the National Agriculture Export Board), PAP 4.5 (implement the agreed fiduciary, including fraud and corruption systems actions), PAP 4.8 (develop and maintain a database of complaints and responses; implementing agencies and districts to report to the Ministry of Agriculture and Animal Resources on fraud and corruption complaints on a quarterly basis), and PAP 4.12 (submit status of implementation of audit recommendations to World Bank quarterly; MINAGRI 2018). Regarding PAP 4.2 (provide on-the-job training to district accounting staff focusing on the consolidation of nonbudget agencies at district level), no data on progress of implementation were provided in the ministry's implementation completion report (MINAGRI 2018), but it was reported as completed in the World Bank's Implementation Completion and Results Report (World Bank 2019).

## Procurement

The following two actions to strengthen procurement aspects were reported as completed: PAP 4.9 (provide on-the-job training and capacity strengthening to the Office of Ombudsman and the Rwanda Public Procurement Authority investigators on annual basis) and PAP 4.13 (implement eProcurement system at implementing entities; MINAGRI 2018).

## Environmental and Social Safeguards

The following two actions to strengthen environmental and social aspects were reported as completed: PAP 4.6 (in collaboration with participating ministries and agencies develop a consolidated Environmental and Social Implementation Manual based on existing government guidelines; and conduct training on the understanding and application of this manual at the national and district level) and PAP 4.7 (develop and implement a communications strategy to sensitize stakeholders about the program and complaints mechanism; MINAGRI 2018).

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## Appendix C. Methods and Evidence

This report is a Project Performance Assessment Report. This instrument and its methodology are described at <https://ieg.worldbankgroup.org/methodology/PPAR>.

This Project Performance Assessment Report gathered the evidence reported in chapters 2–4 to support its findings and conclusions using the following methodology.

**Review of Transformation of Agriculture Sector Program Phase 3 Program-for-Results (PforR 1) documents.** The Independent Evaluation Group (IEG) evaluator began with a review of the documentation produced by the World Bank and the government agencies during project identification, preparation, and implementation. This included the World Bank’s Country Partnership Strategy (2014), Technical Assessment (2014), Integrated Fiduciary Assessment (2014), Environmental and Social Systems Assessment (2014), Program Appraisal Document (2014), financing agreement (2014), Operations Policy and Country Services Assessment of PforR instruments (2016), IEG early assessment of PforR instruments (2016), amendment to financing agreement (2017), relevant aide-mémoire, Implementation Completion and Results Report (2019), Country Partnership Framework (2020), and IEG Implementation Completion and Results Report Review (2021). The IEG evaluator also reviewed the documentation for the related projects (Rural Sector Support Project, Second Rural Sector Project, Third Rural Sector Support Project, and Land Husbandry, Water Harvesting and Hillside Irrigation Project) and the follow-on program (Transformation of Agriculture Sector Program 4 PforR Phase 2). The national governments’ documents included annual reports of the Ministry of Agriculture and Animal Resources, the Rwanda Agriculture and Animal Resources Development Board, and the Office of the Auditor General.

**Review of scholarly articles and reports published by authors external to the World Bank and the government.** The IEG evaluator reviewed scholarly articles and reports from academia, nongovernmental organizations, United Nations funds and programs, multilateral development finance institutions, and bilateral development partners on relevant topics including the coordination and engagement of development partners in the agriculture sector.

**Mission in Rwanda.** The IEG evaluator led a two-week field mission from May 23 to June 3, 2022, to meet with program stakeholders, visit program sites, and consult with program beneficiaries. The mission started with a series of meetings in Kigali with Rwandan government officials involved in implementation of PforR 1 and the related projects and the follow-on program funded by the World Bank. These included the Ministry of Agriculture and Animal Resources, the Rwanda Agriculture and Animal Resources Development Board, the National Agricultural Export Development Board,

the Ministry of Finance and Economic Planning, the Ministry of Local Government, and the Office of the Auditor General. The IEG team met with government officials who played key roles in designing and implementing PforR 1 to collect their perspective on the overall success of the project; challenges and positive outcomes; coordination among implementing agencies; lessons learned; and changes that occurred at the institutional level through the duration, and as a result, of the program. The IEG team also had meetings with bilateral and multilateral development partner agencies, nongovernmental organizations, and academia.

**Field site visits.** The meetings in Kigali were followed by four days of site visits (May 30 to June 2) to 11 sectors in eight districts. The site visits allowed the IEG mission to view investments made during the Transformation of Agriculture Sector Program Phase 3 period (terraces, postharvest infrastructure) and conduct semistructured interviews with program beneficiaries (members of cooperatives) in the field.

**Selection of sites for field visits.** The selection of sites for field visits was made based on criteria proposed by the IEG evaluator to ensure collection of substantial responses from the stakeholders who observed results of agricultural transformation. The criteria considered (i) diversity in geographic location (covering all four provinces and Kigali); (ii) diversity in the types of stakeholders (agricultural technical staff at district and sector government offices, agriculture cooperatives, savings and credit cooperatives, and water users' organizations); (iii) agricultural and livestock products mainly grown in the area (cassava, coffee, milk, maize, rice, beans, and so on); and (iv) composition of cooperative members (number, gender). Given the limited number of subprojects that the virtual mission could cover, it was essential to adopt a purposive sampling procedure rather than a random sampling procedure to enable the mission to understand what worked and what did not work in these specific cases.

**Online survey with agricultural extension officers.** A survey questionnaire consisting of 15 multiple-choice questions was distributed to all agricultural extension officers in Northern, Southern, Western, and Eastern Provinces and Kigali with support from the Ministry of Agriculture and Animal Resources and the Ministry of Local Government. The agricultural inspectors reached out to agricultural extension officers in their responsible administrative division to explain the purpose and contents of the questionnaire. The questions in the questionnaire were kept simple to increase the response rate. Their responses to the survey questionnaire were filled out anonymously and submitted by email.

## Appendix D. PforR 1 Indicators' Alignment to PSTA 3's Programs and Subprograms

Table D.1. PforR 1 Indicators' Alignment with PSTA 3's Programs and Subprograms

PSTA 3		PforR 1 under PSTA 3	
Programs and subprograms	DLIs	PDO indicators and KPIs	Program Action Plans
Program 1: Agriculture and animal resource intensification	DLI 3: Increases in average crop yields for cassava (food crop), coffee (export crop) and milk	PDO indicator 1: Increased agriculture land under modernized agricultural technologies	n.a.
SP 1.1. Soil conservation and land husbandry	DLI 1: Annual increase of land protected against soil erosion, based on agreed technical standards	n.a.	n.a.
SP 1.2. Irrigation and water management	DLI 2: Annual increase in irrigation area in hillsides and marshlands based on agreed technical standards	n.a.	n.a.
SP 1.3. Agricultural mechanization	n.a.	n.a.	n.a.
SP 1.4. Agrochemical use and markets	n.a.	n.a.	n.a.
SP 1.5. Seed development	n.a.	n.a.	n.a.
SP 1.6. Livestock development	n.a.	KPI 4: Increased total milk production	n.a.
SP 1.7. Nutrition and household vulnerability	n.a.	KPI 15: Increased % of households with acceptable levels of food consumption	n.a.
Program 2: Research, technology transfer and professionalization of farmers	n.a.	n.a.	n.a.
SP 2.1. Research and technology transfer	DLI 4: Number of enhanced innovation technologies introduced by public and/or private sector, and adopted by farmers	n.a.	n.a.
SP 2.2. Extension and proximity services for producers	n.a.	n.a.	n.a.
SP 2.3. Farmer cooperatives and organizations	n.a.	KPI 6: Increased % of cooperatives/farmers' organizations that are graded A and B	n.a.

PSTA 3		PforR 1 under PSTA 3	
Program 3: Value chain development and private sector investment	n.a.	PDO indicator 2: Increased agriculture exports	n.a.
SP 3.1. Creating an environment to attract private investment, encourage entrepreneurship, and facilitate market access	n.a.	KPI 7: Increased value (total production and exports) of major competitive value chains KPI 9: Increased private sector investments in agric. sector (domestic and foreign)	PAP 1.2: Prepare position paper on strategic PPP to pursue in the sector
SP 3.2. Development of priority value chains: food crops	n.a.	n.a.	n.a.
SP 3.3. Development of priority value chains: export crops	DLI 3: Increases in average crop yields for ... coffee (export crop)	n.a.	n.a.
SP 3.4. Development of priority value chains: dairy and meat	n.a.	n.a.	n.a.
SP 3.5. Development of priority value chains: fisheries	n.a.	n.a.	n.a.
SP 3.6. Development of priority value chains: apiculture	n.a.	n.a.	n.a.
SP 3.7. Agricultural finance	DLI 5: Percentage increase in agricultural finance lending for agriculture sector	n.a.	n.a.
SP 3.8. Market-oriented infrastructure for postharvest	n.a.	n.a.	n.a.
Program 4: Institutional development and agricultural cross-cutting issues	n.a.	n.a.	n.a.
SP 4.1. Institutional capacity building	n.a.	n.a.	PAP 1.1: Finalize RAB and NAEB strategies PAP 2.1: Implement reforms of RAB and NAEB PAP 2.2: Integrate SPIUs in RAB and NAEB PAP 4.4: Reconcile the accounting/financial statements before and after merger of both RAB and NAEB PAP 4.5: Implement the agreed fiduciary, including fraud and corruption systems actions PAP 4.8: Develop and maintain a database of

PSTA 3	PforR 1 under PSTA 3		
			<p>complaints and responses; implementing agencies and districts to report to MINAGRI on fraud and corruption complaints on a quarterly basis</p> <p>PAP 4.9: Provide on-the-job training and capacity strengthening to OM and Rwanda Public Procurement Authority investigators on annual basis</p> <p>PAP 4.10: Design feasibility studies for large programs investment and a system for investment project approval</p> <p>PAP 4.11: Develop a PFM learning and retention strategy</p> <p>PAP 4.12: Submit status of implementation of audit recommendations to World Bank quarterly</p> <p>PAP 4.13: Implement eProcurement system at implementing entities</p> <p>PAP 4.14: Undertake institutional analysis of key units and delivery agencies including RAB</p> <p>PAP 4.15: Develop and implement an action plan in response to Public Expenditure Review recommendations</p> <p>PAP 5.1: Strengthen the agriculture public expenditure planning and budgetary allocation system</p>
SP 4.2. Decentralization in agriculture	n.a.	n.a.	PAP 2.3: Prepare and implement capacity development plan for decentralized reforms/restructuring
SP 4.3. Legal and regulatory framework	DLI 7: Approval of seeds, fertilizer, and agriculture	n.a.	PAP 4.1: Prepare an operational action plan

PSTA 3	PforR 1 under PSTA 3		
	<p>finance policy, implementation of action plans</p> <p>DLI 8: The approved National Agricultural Policy, Action Plan prepared and approved</p>		<p>to address and strengthen relevant fiduciary aspects, with an emphasis on district-level capacities</p> <p>PAP 4.2: Provide on-the-job training to district accounting staff focusing on the consolidation of nonbudget agencies at district level</p> <p>PAP 4.3: Assess the risk prone areas of the program at the district level and develop a risk profile to be monitored through the program life ensuring that timely mitigation measures are undertaken</p>
<p>SP 4.4. Agricultural communication statistical systems, M&amp;E, and knowledge management</p>	<p>DLI 6: Updated gender-sensitive MIS framework and Action Plan for agricultural sector approved, implementation initiated, and fully operational</p>	<p>n.a.</p>	<p>PAP 4.7: Develop and implement a communications strategy to sensitize stakeholders about the program and complaints mechanism</p> <p>PAP 3.1: Confirm all rural sector infrastructure investments have adequate O&amp;M arrangements</p> <p>PAP 3.2: Implement O&amp;M monitoring system to monitor O&amp;M of major rural infrastructure (as part of the enhanced MIS for agric. sector)</p>
<p>SP 4.5. Gender and youth in agriculture</p>	<p>n.a.</p>	<p>KPI 14: Increase in Women's Empowerment in Agriculture Index for Rwanda</p>	<p>n.a.</p>
<p>SP 4.6. Environmental mainstreaming in agriculture</p>	<p>n.a.</p>	<p>n.a.</p>	<p>PAP 4.6: In collaboration with participating ministries and agencies, develop a consolidated Environmental and Social Implementation Manual based on existing government guidelines; and conduct training on the understanding and application of this</p>

manual at the national and district level  
 PAP 4.16: Update environment and social impact management guidelines to include issues of small dams and undertake training of MINAGRI and district staff

Sources: MINAGRI 2013; World Bank 2014.

Note: DLI = disbursement-linked indicator; KPI = key performance indicator; M&E = monitoring and evaluation; MINAGRI = Ministry of Agriculture and Animal Resources; MIS = management information system; n.a. = not applicable; NAEB = National Agricultural Export Development Board; O&M = operation and maintenance; OM = Office of the Ombudsman; PAP = Program Action Plan; PDO = program development objective; PFM = public financial management; PforR = Program-for-Results; PPP = public-private partnership; PSTA 3 = Transformation of Agriculture Sector Program Phase 3; RAB = Rwanda Agriculture and Animal Resources Development Board; SP = subprogram; SPIU = Single Project Implementation Unit.

## References

MINAGRI (Ministry of Agriculture and Animal Resources). 2013. *Strategic Plan for the Transformation of Agriculture in Rwanda Phase III*. Kigali: MINAGRI.

World Bank. 2014. "Rwanda—Transformation of Agriculture Sector Program Phase 3." Program Appraisal Document 89984-RW, World Bank, Washington, DC.

# Appendix E. Program-for-Results 1—Results Framework

Table E.1. Results Framework

Results Indicators	Indicators	Baseline	Target	Actual (2018)	Target Achieved or Not		
Program development objective: Increase and intensify the productivity of the Rwandan agricultural and livestock sectors and expand the development of value chains							
Outcome 1: Increased and intensified productivity of the Rwandan agricultural and livestock sectors							
Increased agricultural land under modernized agricultural technologies (%)	PI 1	19	34	31	Not achieved		
Increased soil erosion control, based on agreed technical standards, and sustainably maintained (hectares)	KPI 1	DLI 1	802,292 (P)	919,561 (P)	923,604 (P)	Achieved	
			46,246 (R)	103,981 (R)	110,041 (R)		
			848,538 (T)	1,023,479 (T)	1,033,645 (T)		
Increased land (hillsides and marshlands) developed with (i) irrigation infrastructure, based on MINAGRI technical standards; and (ii) enhanced O&M (hectares)	KPI 2	DLI 2	3,075 (H)	8,500 (H)	11,987 (H)	Achieved	
			24,721 (M)	36,000 (M)	36,521 (M)		
			27,796 (T)	44,500 (T)	48,508 (T)		
Increased average productivity levels of major food and export crops, and livestock commodity	KPI 3	DLI 3	Cassava: 15 t/ha	Cassava: 19 t/ha	Cassava: 19 t/ha	Achieved for cassava and milk	
			Coffee: 2.2 kg/tree/year	Coffee: 2.9 kg/tree/year	Coffee: 2.8 kg/tree/year		Not achieved for coffee
			Milk: 4.0 L/cow/day	Milk: 6.2 L/cow/day	Milk: 6.3 L/cow/day		
Increased total milk production (liters)	KPI 4	503,000	780,000	816,791	Achieved		
Outcome 2: Expanded development of value chains							
Increased agriculture exports (%)	PI 2	22	25	44.7	Achieved		
Number of enhanced technology innovations introduced by public and/or private sectors (no.); and adopted rates by farmers (%)	KPI 5	DLI 4	5	6	6	Achieved for number of enhanced technology innovations	
			25%	70%	54.5%		Not achieved for adoption rate



Increased percentage of cooperatives/farmers' organizations that are graded A and B			5	35 (A) n.a. (B)	54 (A) 42 (B)	Achieved
Increased value (total production and exports) of major competitive value chains (US\$, millions)	KPI 7		VP: n.a. VE: 132	VP: n.a. VE: 309	VP: 3.05 VE: 516	No baseline or target for production Achieved for exports
Increased agrifinance lending for farmers (including gender targets; US\$, millions)	KPI 8	DLI 5	3.6	7.6	6.8	Not achieved
Increased private sector investments in agricultural sector (domestic and foreign; US\$, millions)	KPI 9		513	730	774.5	Achieved
Increased percentage of agricultural production marketed (%)	KPI 10		21	25	23	Not achieved
Outcome 3: Institutional capacity building						
Enhanced results-focused institutional capacity development of MINAGRI and districts: AP updated or prepared; AP implementation initiated, and AP fully operational	KPI 11		Nonexistent in MINAGRI and districts	MIS rolled out in 30 districts and producing regular reports by end of June 2016	MINAGRI and districts AP fully operational The target has been met at 100% because MIS was rolled out in 30 districts and is producing regular reports	Achieved
Updated MIS framework and AP for agric. sector: completed, approved, initiated, and fully operational (with key reports, on "core" indicators)	KPI 12	DLI 6	Initial draft M&E framework	MIS rolled out to 30 districts and producing regular reports by June 2017	MIS functional in all 30 districts	Achieved
Approval of seed, fertilizer, and agricultural finance policy, AP prepared and implemented	KPI 13	DLI 7	Seed policy does not exist Initial draft of fertilizer policy No existing policy on agricultural finance	Approval of agricultural finance strategy by the end of August 2016; the new and approved NAP would incorporate the enhanced policies for seeds, fertilizer,	Agricultural policy reforms are implemented: seeds, fertilizer, and agricultural finance policies and AP prepared and implemented	Achieved

				and agricultural finance		
Increase in Women's Empowerment in Agriculture Index for Rwanda (%)	KPI 14	91		93	91	Not achieved
Increased percentage of households with acceptable levels of food consumption (%)	KPI 15	20		23	23	Achieved
The approved NAP, AP prepared and approved	DLI 8	—		NAP approval by ASWG June 30, 2017	The NAP was approved by the ASWG in June 2017	Achieved

Sources: World Bank 2014, World Bank 2019, and World Bank 2021

Note: AP = Action Plan; ASWG = Agriculture Sector Working Group; DLI = disbursement-linked indicator; H = hillsides; KPI = key performance indicator; M = marshland; M&E = monitoring and evaluation; MINAGRI = Ministry of Agriculture and Animal Resources; MIS = management information system; NAP = National Agricultural Policy; O&M = operation and maintenance; P = progressive; PI = program development objective indicator; R = radical; T = total; t/ha = tons per hectare; VE = value of exports; VP = value of production.

## References

World Bank. 2014. "Rwanda—Transformation of Agriculture Sector Program Phase 3." Program Appraisal Document 89984-RW, World Bank, Washington, DC.

World Bank. 2019. "Rwanda—Transformation of Agriculture Sector Program Phase 3." Implementation Completion and Results Report 135672-RW, World Bank, Washington, DC.

World Bank. 2021. "Rwanda—Transformation of Agriculture Sector Program Phase 3." Implementation Completion and Results Report Review ICRR0022273, Independent Evaluation Group, World Bank, Washington, DC.

## Appendix F. Disbursement-Linked Indicators: Comparison of Phases 1 and 2 of the Programs-for-Results

There were eight disbursement-linked indicators (DLIs) for the Rwanda Transformation of Agriculture Sector Program Phase 3 Program-for-Results (PforR 1) at program closing. DLIs 1–3 were established under intermediate results area 1 (Agriculture and Animal Resource Intensification), DLI 4 under intermediate results area 2 (Research, Technology Transfer and Organization of Farmers), DLI 5 under intermediate results area 3 (Private Sector–Driven Value Chain Development and Expanded Investments), and DLIs 6–8 under intermediate results area 4 (Institutional Results-Focused Development and Cross-Cutting Issues). The largest DLI budget allocation of 45 percent indicates that the intensification of agriculture and animal resources production under intermediate results area 1 was the primary focus of PforR 1.

**Table F.1. PforR 1: DLIs and Their Allocation as Share of Total IDA Credit and Multidonor Trust Fund Grants at Program Closing (percent)**

Description of DLI	DLI Allocation as Share of Total IDA Credit and MDTF Grants
IR area 1: Agriculture and Animal Resource Intensification.	
DLI 1: Annual increases in terraced land area (progressive and radical), based on agreed technical standards.	20
DLI 2: Annual increases of irrigated area in marshlands and hillsides, based on agreed technical standards, with adequate O&M.	10
DLI 3: Increases in average crop yields and productivity for key food crop, export commodity, and livestock product—cassava, coffee, and milk.	15
IR area 2: Research, Technology Transfer and Organization of Farmers.	
DLI 4: Number of innovation technologies introduced and released by public and/or private sectors, and adopted by farmers.	15
IR area 3: Private Sector–Driven Value Chain Development and Expanded Investments.	
DLI 5: Increase in agricultural finance lending for agriculture sector (production and agroprocessing).	7
IR area 4: Institutional Results-Focused Development and Cross-Cutting Issues.	
DLI 6: Enhanced gender-sensitive MIS framework and action plan for agricultural sector completed, approved, initiated, and fully operational.	10
DLI 7: Approval of seeds, fertilizer, and agricultural finance policies, and preparation and initial implementation of action plan.	20
DLI 8: Extent to which an updated national agricultural policy has been approved. Action plan prepared and approved.	3

Description of DLI	DLI Allocation as Share of Total IDA Credit and MDTF Grants
Total	100

Source: World Bank 2019.

Note: DLI = disbursement-linked indicator; IDA = International Development Association; IR = intermediate results; MDTF = multidonor trust fund; MIS = management information system; O&M = operation and maintenance; PforR 1 = Rwanda Transformation of Agriculture Sector Program Phase 3 Program-for-Results.

There were nine DLIs for PforR 2 at program closing. DLIs 1–4 were established under results area 1 (Policy and Organizational Reform), DLIs 5–7 under results area 2 (Enabling Agricultural Commercialization), DLI 8 under results area 3 (Delivery of Improved Agricultural Value Chain Services), and DLI 9 under results area 4 (Efficiency in Public Expenditures). Results areas 1 and 4, both focusing on policy and organizational reform, had the largest shares of DLI budget allocations, totaling 49 percent. Compared with the DLIs for PforR 1, the DLIs for PforR 2 shifted focus from the intensification of production to the value chain development. DLIs 5 and 6 of PforR 2 aimed for expansion of irrigated and terraced areas with a notion of commercial viability, building on the experience of DLIs 1 and 2 of PforR 1.

**Table F.2. PforR 2: DLIs and Their Allocation as Share of Total IDA Credit and Multidonor Trust Fund Grants at Program Closing (percent)**

Description of DLIs	DLI Allocation as Share of Total IDA Credit and MDTF Grants
Results area 1: Policy and Organizational Reform	
DLI 1: Organizational Development Plan successfully prepared and implementation on track	11
DLI 2: Improved analytical and policy reform competencies demonstrated	11
DLI 3: Digital information platforms designed and operational	9
DLI 4: Mechanism to strengthen Agriculture Public-Private Dialogues and Agriculture Value Chain Platforms designed and implemented	10
Results area 2: Enabling Agricultural Commercialization	
DLI 5: New irrigation area identified, developed and/or managed where commercial viability has been a determining appraisal criterion	10
DLI 6: New terracing area identified, developed and/or managed where commercial viability has been a determining appraisal criterion	10
DLI 7: Volume of private sector investment (in \$) matching public financing in PPP infrastructure project	17
Results area 3: Delivery of Improved Agricultural Value Chain Services	
DLI 8: Private sector extension service models designed, launched and achieving positive response	14
Results area 4: Efficiency in Public Expenditures	

Description of DLIs	DLI Allocation as Share of Total IDA Credit and MDTF Grants
DLI 9: Reform of RAB (RAB Restructuring Order prepared and approved; +/- 3% Deviation between budget and out turn expenditure 2019/20; and Unqualified audit opinion on financial statement of RAB)	8
Total	100

Source: MINAGRI 2022.

Note: DLI = disbursement-linked indicator; IDA = International Development Association; MDTF = multidonor trust fund; PPP = public-private partnership; RAB = Rwanda Agriculture and Animal Resources Development Board; PforR 2 = Transformation of Agriculture Sector Program 4 Program-for-Results Phase 2.

## References

MINAGRI (Ministry of Agriculture and Animal Resources). 2022. *Borrower's Implementation Completion and Results Report for the Transformation of Agriculture Sector Program 4 Program-for-Results Phase 2*. Kigali: MINAGRI.

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## Appendix G. Survey of Agricultural Extension Officers

The Independent Evaluation Group team conducted an online survey with agricultural extension officers serving at district and sector levels between June 8 and 17, 2022. The survey questionnaire included 15 questions listed below. Methodologies are described in appendix C.

1. Which level of administrative division do you serve as an agricultural extension service officer?

There are 212 respondents in total. Of the total, 26 and 186 respondents answered that they serve at the district or sector level, respectively (see table G.1). There are 30 districts and 416 sectors in Rwanda.<sup>24</sup> At the district level, the three main types of respondents are director of Agriculture and Animal Resources unit staff, district agronomist, and cash crop officer (which is the position established based on local needs). Some provinces submitted multiple responses from different respondents in different positions. At the sector level, all the respondents are sector agronomists.

**Table G.1. Survey Respondents by District and Sector**

Area	Respondents (no.)
District	26
Sector	186
Total	212

*Source:* Independent Evaluation Group.

2. In which province is the administrative division you serve located?

Table G.2 shows the number of respondents in each province, with Western Province providing the most responses. The differences in the number of responses in provinces are driven by the number of responses received from sectors. All provinces received six or seven responses from districts. Western Province, however, produced more than twice the sector-level responses of Southern Province.

**Table G.2. Survey Respondents by Province**

Province	Respondents		
	(no.)	District	Sector
Western Province	70	7	63
Eastern Province	63	6	57
Northern Province	43	6	37
Southern Province	36	7	29
Total	212	26	186

Source: Independent Evaluation Group.

3. What is the most important crop or livestock product for household consumption for the farmers in your administrative division? Please select up to three.

The most important crops for household consumptions are beans, maize, bananas or plantains, cassava, and Irish potato (table G.3).

**Table G.3. Most Important Crop or Livestock Products for Household Consumption**

Crop or Livestock Product	Responses (no.)	Responses (% of total)
What is the most important crop or livestock product for household consumption for the farmers in your administrative division? Please select up to three.		
Beans	191	22
Maize	176	20
Banana/plantains	95	11
Cassava	80	9
Irish potato	64	7
Sweet potatoes	48	6
Milk	41	5
Rice	36	4
Coffee	30	3
Meat	27	3
Wheat	20	2
Eggs	19	2
Tea	14	2
Other	13	2
Pyrethrum	5	1
Total <sup>a</sup>	859	100

Source: Independent Evaluation Group.

a. Some respondents provided fewer or more than three choices of crops, livestock products, or both.

4. What is the most important crop or livestock products that are marketable for the farmers in your administrative division? Please select up to three.

The most important marketable crops are maize, beans, bananas or plantains, Irish potato, and cassava (table G.4). When the responses for question 3 and 4 are compared, the top five important crops for farmers are the same for both household consumption and marketing.

**Table G.4. Most Important Marketable Crop or Livestock Products**

Crop or Livestock Product	Responses (no.)	Responses (% of total)
What is the most important crop or livestock products that are marketable for the farmers in your administrative division? Please select up to three.		
Maize	152	19
Beans	135	17
Banana/plantains	93	11
Irish potato	66	8
Cassava	60	7
Coffee	60	7
Milk	50	6
Rice	39	5
Meat	35	4
Sweet potatoes	34	4
Tea	24	3
Eggs	23	3
Wheat	18	2
Other	16	2
Pyrethrum	4	0
Total <sup>a</sup>	809	100

Source: Independent Evaluation Group.

a. Some respondents provided fewer or more than three choices of crops, livestock products, or both.

- Are you aware of agricultural technologies that have been adopted among farmers in the area you serve? Examples of agricultural technologies include, but are not limited to, improved seeds, fertilizers, and pesticides.

Almost all the survey respondents indicated that they are aware of agricultural technologies that have been adopted among farmers in their administrative division (table G.5).



**Table G.5. Farmers' Awareness of Adopted Agricultural Technologies**

	Respondents (no.)	Respondents (% of total)
Are you aware of agricultural technologies that have been adopted among farmers in the area you serve? Examples of agricultural technologies include, but are not limited to, improved seeds, fertilizers, and pesticides.		
Yes	207	98
No	3	1
No answer	2	1
Total	212	100

Source: Independent Evaluation Group.

6. What were the new agricultural technologies that were adopted? Choose all that apply.

A wide range of new agricultural technologies (fertilizers, improved seeds for rain-fed lands, anti-erosion measures, pesticides, and postharvest facilities) are adopted by farmers, except for technologies related to irrigation (irrigation infrastructure and improved seeds for irrigated lands; table G.6). In particular, more than 80 percent of survey respondents responded that farmers adopted inorganic and organic fertilizers and improved seeds for rain-fed lands.

**Table G.6. New Agricultural Technologies Adopted by Farmers**

Agricultural Technologies	Responses (no.)	Respondents (% of total)
What were the new agricultural technologies that were adopted? Choose all that apply.		
Inorganic fertilizers	181	85
Improved variety/quality of seeds for rain-fed lands	174	82
Organic fertilizers	172	81
Anti-erosion measures	161	76
Pesticides	156	74
Postharvest technologies	113	53
Improved variety/quality of seeds for irrigated lands	82	39
Irrigation infrastructure	76	36
Other	4	2
Total <sup>a</sup>	1,119	n.a.

Source: Independent Evaluation Group.

Note: n.a. = not applicable.

a. All 212 survey respondents answered this question.

7. What are the main reasons the farmers in your administrative division did not adopt agricultural technologies? Please check all that apply.

Lack of financial resources is widely recognized as one of the main reasons for the farmers not adopting agricultural technologies because 92 percent of respondents to question 7 indicated it, followed by lack of technical knowledge (50 percent; table G.7).

**Table G.7. Main Reasons for Not Adopting Agricultural Technologies**

<b>Reason to Not Adopt Agricultural Technologies</b>	<b>Responses (no.)</b>	<b>Respondents (% of total)</b>
What are the main reasons the farmers in your administrative division did not adopt agricultural technologies? Please check all that apply.		
Lack of financial resources	190	92
Lack of technical knowledge	104	50
Other <sup>a</sup>	25	12
No interest	22	11
Lack of time	10	5
<b>Total<sup>b</sup></b>	<b>351</b>	<b>n.a.</b>

Source: Independent Evaluation Group.

Note: n.a. = not applicable.

a. Of 25 respondents who responded "other," 11 respondents indicated resistance to change and mind-set as a main reason for nonadoption. The other reasons include lack of investment capacity, limited availability and access in the market, lack of training to farmers, climate variability and natural disasters, lack of market outlets for their produce, lack of raw materials for organic fertilizers, and lack of a water source for irrigation.

b. A total of 206 survey respondents answered this question.

8. Are you aware of institutional strengthening that have been observed among farmers in the area you serve? Examples of institutional strengthening among farmers include, but are not limited to, organizing agricultural cooperatives and water users' associations, organizing maintenance of facilities and equipment, increasing women's participations in local groups.

Most survey respondents indicated that they have observed institutional strengthening among farmers in their administrative division (table G.8).

**Table G.8. Awareness of Institutional Strengthening among Farmers**

<b>Awareness of Institutional Strengthening</b>	<b>Responses (no.)</b>	<b>Respondents (% of total)</b>
Are you aware of institutional strengthening that have been observed among farmers in the area you serve? Examples of institutional strengthening among farmers include, but are not limited to, organizing agricultural cooperatives and water users' associations, organizing maintenance of facilities and equipment, increasing women's participations in local groups.		
Yes	192	91
No	18	9
No answer	2	1
<b>Total</b>	<b>212</b>	<b>100</b>

Source: Independent Evaluation Group.

9. What were the institutional strengthening among farmers that were observed?  
Choose all that apply.

Organizing agricultural cooperatives is widely observed as institutional strengthening among farmers, as indicated by 94 percent of respondents to question 9, followed by increasing women's participations in local groups (59 percent; table G.9).

**Table G.9. Institutional Strengthening Observed among Farmers**

<b>Institutional Strengthening</b>	<b>Responses (no.)</b>	<b>Respondents (% of total)</b>
What were the institutional strengthening among farmers that were observed? Choose all that apply.		
Organizing agricultural cooperatives	197	94
Increasing women's participation in local groups	124	59
Organizing maintenance of facilities and equipment	89	43
Organizing water users' associations	83	40
Other	12	6
<b>Total<sup>a</sup></b>	<b>505</b>	<b>n.a.</b>

Source: Independent Evaluation Group.

Note: n.a. = not applicable.

a. A total of 209 survey respondents answered this question.

10. What are the main reasons for which the institutional strengthening (capacity building) was not observed among the farmers in your administrative division?  
Please check all that apply.

Lack of financial resources is largely recognized as one of the main reasons that institutional strengthening is not observed among the farmers, as indicated by 85 percent of respondents to question 10, followed by lack of technical knowledge (41 percent; table G.10).

**Table G.10. Main Reasons Institutional Strengthening Not Observed among Farmers**

<b>Reason Institutional Strengthening Not Observed</b>	<b>Responses (no.)</b>	<b>Respondents (% of total)</b>
What are the main reasons for which the institutional strengthening (capacity building) was not observed among the farmers in your administrative division? Please check all that apply.		
Lack of financial resources	162	85
Lack of technical knowledge	77	41
Other <sup>a</sup>	16	8
No interest	17	9
Lack of time	15	8
<b>Total<sup>b</sup></b>	<b>287</b>	<b>n.a.</b>

Source: Independent Evaluation Group.

Note: n.a. = not applicable.

a. Of 16 respondents who responded "other," 5 indicated low mind-set and lack of objectives of farmers as a main reason that institutional strengthening is not observed. The other reasons include lack of market, a large population working in another industry (mining), limited (not lack of) financial resources, and certain technologies not being practical in the area.  
 b. A total of 190 survey respondents answered this question.

11. In which stage of value chains do the farmers in your administrative division most interact with private sectors?

**Table G.11. Stage of Value Chains When Farmers Most Interact with Private Sectors**

Stage of Value Chain with Most Interaction	Responses (no.)	Respondents (% of total)
In which stage of value chains do the farmers in your administrative division most interact with private sectors?		
Trading	126	61
Transport	113	54
Storing	98	47
Distributing	78	38
Processing	64	31
Packaging	48	23
Other	1	0
Total <sup>a</sup>	528	n.a.

Source: Independent Evaluation Group.

Note: n.a. = not applicable.

a. A total of 208 survey respondents answered this question.

12. How often do the farmers in your administrative division interact with private sectors in value chains?

**Table G.12. Frequency of Farmers' Interaction with Private Sectors in Value Chains**

Frequency of Interaction	Responses (no.)	Respondents (% of total)
How often do the farmers in your administrative division interact with private sectors in value chains?		
Every quarter	64	30
Daily	46	22
Twice a year	41	20
A few times a week	33	16
A few times a month	28	13
Once a week	14	7
Once a month	4	2
Once a year	4	2
Other	1	0
Total <sup>a</sup>	235	n.a.

Source: Independent Evaluation Group.

Note: n.a. = not applicable.

a. A total of 210 survey respondents answered this question.

13. How well do you feel you are performing in Imihigo of your administrative division now?

**Table G.13. Agricultural Extension Officers' Self-Rating on Imihigo Performance, 2022**

<b>Imihigo Self-Rating</b>	<b>Responses (no.)</b>	<b>Respondents (% of total)</b>
How well do you feel you are performing in Imihigo of your administrative division now?		
Very well	170	80
Somewhat well	41	19
Neither well nor poorly	0	0
Somewhat poorly	1	0
Very poorly	0	0
<b>Total</b>	<b>212</b>	<b>100</b>

Source: Independent Evaluation Group.

14. How well did you feel you were performing in Imihigo of your administrative division prior to 2014?

**Table G.14. Agricultural Extension Officers' Self-Rating on Imihigo Performance before 2014**

<b>Imihigo Self-Rating</b>	<b>Responses (no.)</b>	<b>Respondents (% of total)</b>
How well did you feel you were performing in Imihigo of your administrative division prior to 2014?		
Very well	103	49
Somewhat well	56	26
Neither well nor poorly	8	4
Somewhat poorly	2	1
Very poorly	0	0
I was not working in the administrative division at that time	43	20
<b>Total</b>	<b>212</b>	<b>100</b>

Source: Independent Evaluation Group.

15. How satisfied are you with the support you receive from the Rwanda Agriculture and Animal Resources Development Board and the National Agricultural Export Development Board?

The majority (83 percent) of respondents expressed satisfaction with the support they receive from the Rwanda Agriculture and Animal Resources Development Board and the National Agricultural Export Development Board, which is a remarkable result. Note that a social desirability bias might be at play here (table G.15).

**Table G.15. Agricultural Extension Officers' Satisfaction with Support from RAB and NAEB**

<b>Satisfaction Rating</b>	<b>Responses (no.)</b>	<b>Respondents (% of total)</b>
How satisfied are you with the support you receive from the Rwanda Agriculture and Animal Resources Development Board and the National Agricultural Export Development Board?		
Very satisfied	50	24
Somewhat satisfied	125	59
Neither satisfied nor unsatisfied	20	9
Somewhat unsatisfied	15	7
Very unsatisfied	2	1
<b>Total</b>	<b>212</b>	<b>100</b>

*Source:* Independent Evaluation Group.

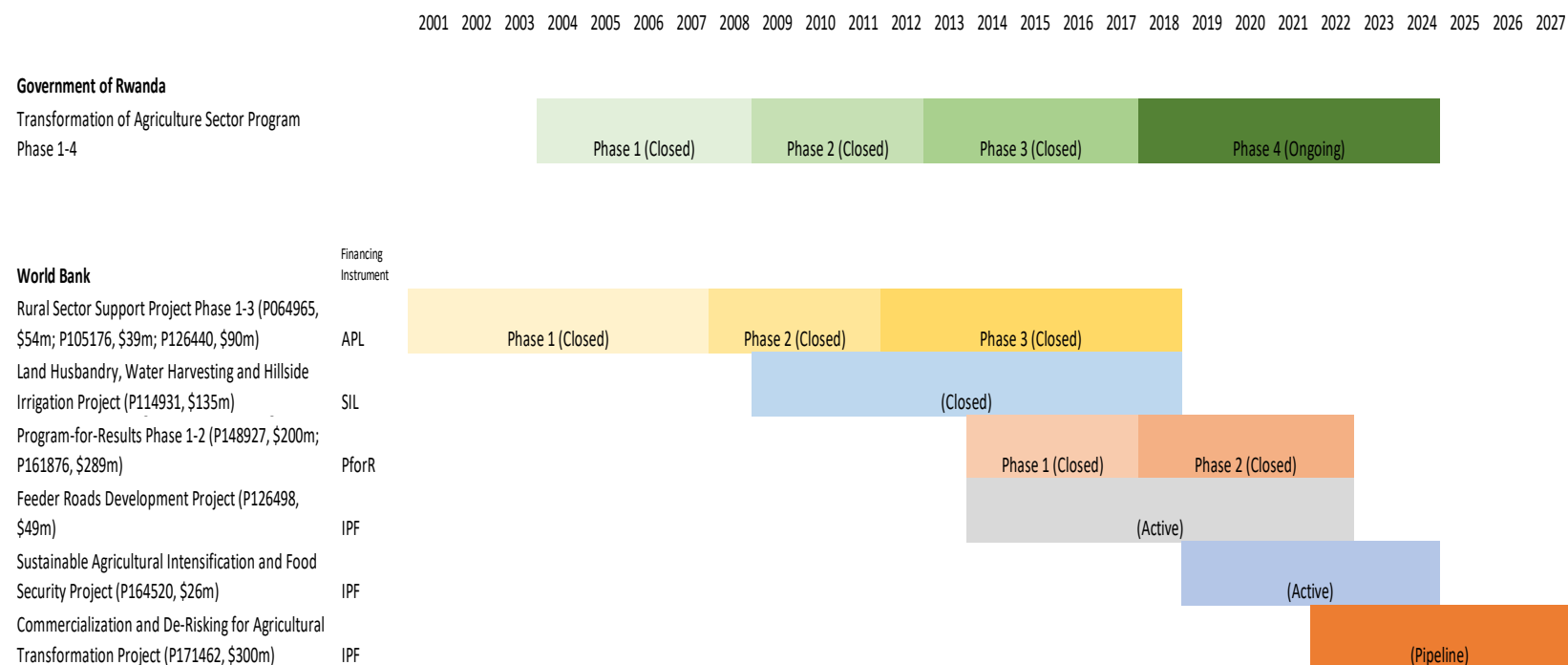
*Note:* NAEB = National Agricultural Export Development Board; RAB = Rwanda Agriculture and Animal Resources Development Board.

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<sup>24</sup> National Institute of Statistics of Rwanda (website), <https://www.statistics.gov.rw/survey/districts-baseline-survey>.

# Appendix H. World Bank Support to Rwanda's Agriculture Sector (2001–27)

Figure H.1. World Bank Support to Rwanda's Agriculture Sector (2001–27)



Source: Independent Evaluation Group.

Note: All dollar amounts are US dollars. APL = adaptable program loan; IPF = investment project financing; m = million; PforR = Program-for-Results; SIL = specific investment loan.

## Appendix I. Borrower Comments

The Independent Evaluation Group (IEG) Project Performance Assessment Report (PPAR) team's responses to the borrower's comments are presented below.

**Borrower comment 1.** "Methodology of evaluation and sampling was not provided"

**PPAR team's response.** This PPAR instrument and the methodology for this evaluation are discussed in appendix C.

**Borrower comment 2.** "List of respondents and their position is missing. In some part, the report highlight that agriculture extensionists staff responded to the questionnaire and raised issue of insufficient budget allocated by [Ministry of Finance and Economic Planning] and lack of capacity of staff in agriculture sector that seems to be biased because the evaluators could have worked with the primary budget managers and planners. These staff are not the right people on that aspects. In many case they don't have even details on budget and planned interventions across the sector."

**PPAR team's response.** List of persons consulted is no longer included in an appendix of PPAR as per IEG guidelines. The PPAR team triangulates data as much as possible and consults the relevant stakeholders. In this case, regarding budget allocation and staffing adequacy, the stakeholders that the PPAR team consulted included field staff, ministry officials, development partners, academia, and nonprofit organizations. The PPAR team reached out to the stakeholders to schedule interviews in person or online, and if interviews were not feasible, asked the stakeholders to provide written responses to interview questionnaires. The PPAR team also made diligent follow-ups with stakeholders to obtain relevant detailed data.

**Borrower comment 3.** "The report is citing that they got information from many sources and end up with conclusion that are not realistic looking on what is available on ground without citing those sources."

For example, page xiv and 23

"The evaluation team received comments from multiple sources that indicated limited human resources especially at technical level were associated with the Ministry of Agriculture and Animal Resources' challenges to secure sufficient allocation and timely disbursement of funds from the Ministry of Finance and Economic Planning (interview)."

**PPAR team's response.** The sentence cited above indicates the source of information: during IEG's interviews, multiple respondents provided the above comments.



**Borrower comment 4.** “In many paragraph, the evaluation report highlights interview conducted, but don’t specify with who are the respondents and no details on data collected and interpretations.”

**PPAR team’s response.** As per IEG guidelines, the PPAR team cannot provide information regarding who provided the comments. Details on the methodology and the data collected and interpreted for the PPAR and the survey with agricultural extension officers are included in appendixes C and G.

**Borrower comment 5.** “The report indicates on 4.14 that they used external source on data while we have certified and reliable data published periodically by [National Institute of Statistics of Rwanda].”

**PPAR team’s response.** The PPAR team had checked the data published by National Institute of Statistics of Rwanda; however, no specific figure corresponding to the cited data was available.