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Report No: PAD5488

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

PROJECT APPRAISAL DOCUMENT
ON A
PROPOSED GLOBAL AGRICULTURE AND FOOD SECURITY PROGRAM GRANT

IN THE AMOUNT OF US$20 MILLION

TO THE

REPUBLIC OF RWANDA

FOR A

THE SECOND SUSTAINABLE AGRICULTURAL INTENSIFICATION AND FOOD SECURITY PROJECT
(P181077)
{RVP/CD CLEARANCE DATE}

Agriculture and Food
Eastern And Southern Africa

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CURRENCY EQUIVALENTS

(Exchange Rate Effective October XX, 2023)

Currency Unit =	Rwandan Franc (RWF)
RWF.....=	US$1

FISCAL YEAR
July 1 - June 30

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ABBREVIATIONS AND ACRONYMS

AFIRR	Access to Finance for Recovery and Resilience Project
AM	Accountability Mechanisms
AIF	Africa Improved Foods
BAU	Business as Usual
BCC	Behavior Change Communication
BCR	Benefit-Cost Ratio
BNR	National Bank of Rwanda (Banque Nationale du Rwanda)
CCDR	Country Climate and Development Report
CDAT	Commercialization and De-risking for Agricultural Transformation Project
CDD	Community Driven Development
CDRS	Climate and Disaster Risk Screening
CE	Citizen Engagement
CFSVA	Comprehensive Food Security and Vulnerability Analysis
CGIAR	Consultative Group on International Agricultural Research
CHW	Community Health Workers
CIP	Crop Intensification Program
COVID-19	The 2019 Coronavirus Disease
CPI	Consumer Price Index
CPF	Country Partnership Framework
CPS	Country Partnership Strategy
CPSD	Country Private Sector Diagnostics
CRI	Core Results Indicator
CSA	Climate-Smart Agriculture
DA	Designated Account
DG	Director General
DP	Development Partner
EFA	Economic and Financial Analysis
EICV	Integrated Household Living Conditions Survey
EIRR	Economic Internal Rate of Return
ESCP	Environmental and Social Commitment Plan
E&S	Environmental and Social
ESF	Environmental and Social Framework
ESHS	Environmental, Social, Health and Safety
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESS	Environmental and Social Standard
EX-ACT	Ex Ante Carbon-Balance Tool
FAO	Food and Agriculture Organization of the United Nations
FAB	Farming as Business
FBDGs	Food-Based Dietary Guidelines
FCS	Food Consumption Score
FFS	Farmers Field School

FIES	Food Insecurity Experience Score
FM	Financial Management
FMS	Financial Management Specialist
FQM	Food Quality Management
GAFSP	Global Agriculture and Food Security Program
GAP	Good Agriculture Practices
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GoR	Government of Rwanda
GRC	Grievance Redress Committee
GRM	Grievance Redress Mechanism
GRS	Grievance Redress System
ICB	International Competitive Bidding
ICR	Implementation Completion and Results Report
ICT	Information and Communication Technology
ICT4RAg	ICT for Rwanda Agriculture
IFAD	International Fund for Agriculture Development
IFMIS	Integrated Financial Management System
IFR	Interim Financial Report
IMSAR	Improving Market System for Agriculture in Rwanda
INM	Integrated Nutrient Management
IPF	Investment Project Financing
IPMP	Integrated Pest Management Plan
IPSAS	International Public Sector Accounting Standards
KCB	Kenya Commercial Bank
KOICA	Korea International Cooperation Agency
KPI	Key Performance Indicator
LCS	Least Cost-based Selection
LMP	Labor Management Procedures
LRP	Livelihoods Restoration Program
LWH	Land Husbandry, Water Harvesting, and Hillside Irrigation Project
M&E	Monitoring and Evaluation
MFI	Microfinance Institution
MINAGRI	Ministry of Agriculture and Animal Resources
MINECOFIN	Ministry of Finance and Economic Planning
MIS	Management Information System
NCB	National Competitive Bidding
NDC	National Determined Contributions
NISR	National Institute of Statistics of Rwanda
NPV	Net Present Value
NSA	Nutrition-Sensitive Agriculture
NST	National Strategy for Transformation
O&M	Operations and Maintenance
OAG	Office of the Auditor General

OHS	Occupational Health and Safety
OP	Operational Policy
PA	Paris Agreement
PDO	Project Development Objective
PEFA	Public Expenditure and Financial Accountability
PFM	Public Financial Management
PforR	Program-for-Result
PIM	Project Implementation Manual
PMP	Pest Management Plan
PPP	Public-Private Partnership
PPSD	Project Procurement Strategy for Development
PRAMS	Procurement Risk Assessment and Management System
PSC	Project Steering Committee
PSTA	Strategic Plan for Agriculture Transformation (Plan Stratégique pour la Transformation Agricole)
QCBS	Consultants Quality and Cost-based Selection
RAB	Rwanda Agriculture and Animal Resources Development Board
RAP	Resettlement Action Plan
REMA	Rwanda Environment Management Authority
RERP	Rwanda Economic Recovery Program
RF	Results Framework
RFQ	Request for Quotations
RPF	Resettlement Policy Framework
RPPA	Rwanda Public Procurement Authority
RSB	Rwanda Standards Board
RSSP	Rural Sector Support Project
RWF	Rwandan Franc
SACCO	Savings and Credit Cooperative
SAIP	Sustainable Agricultural Intensification and Food Security Project
SBCC	Social Behavior Change Communication
SBD	Standard Bidding Document
SC	Steering Committee
SEA/SH	Sexual Exploitation and Abuse/Sexual Harassment
SEP	Stakeholder Engagement Plan
SHG	Self-Help Group
SME	Small and Medium Enterprises
SORT	Systematic Operation Risk Rating Tool
SPD	Standard Procurement Documents
SPIU	Single Project Implementing Unit
SSIT	Small Scale Irrigation Technology Development Program
STEP	Systematic Tracking of Exchanges in Procurement
TA	Technical Assistance
TFP	Total Factor Productivity
ToC	Theory of Change

ToT	Training of Trainers
UN	United Nations
VfM	Value for Money
WFP	World Food Program
WUA	Water Users Association

TABLE OF CONTENTS

DATASHEET

BASIC INFORMATION

Project Beneficiary(ies)	Operation Name		
Rwanda	SUSTAINABLE AGRICULTURAL INTENSIFICATION AND FOOD SECURITY PROJECT II		
Operation ID	Financing Instrument	Environmental and Social Risk Classification	
P181077	Investment Project Financing (IPF)	Substantial	

Financing & Implementation Modalities

[ ] Multiphase Programmatic Approach (MPA)	[ ] Contingent Emergency Response Component (CERC)
[ ] Series of Projects (SOP)	[ ] Fragile State(s)
[ ] Performance-Based Conditions (PBCs)	[ ] Small State(s)
[ ] Financial Intermediaries (FI)	[ ] Fragile within a non-fragile Country
[ ] Project-Based Guarantee	[ ] Conflict
[ ] Deferred Drawdown	[ ] Responding to Natural or Man-made Disaster
[ ] Alternative Procurement Arrangements (APA)	[ ] Hands-on Expanded Implementation Support (HEIS)

Expected Approval Date	Expected Closing Date
31-Oct-2023	31-Dec-2026
Bank/IFC Collaboration	
No	

Proposed Development Objective(s)

To increase agricultural productivity, market access, and food security of the targeted beneficiaries in the project areas.

Components

Component Name	Cost (US$)

Component 1: Institutional Strengthening, Agriculture Productivity Enhancement, and Nutrition Improvement	6,810,000.00
Component 2: Irrigation and Water Use Efficiency	0.00
Component 3: Market Linkages and Value Addition Investments Support	0.00
Component 4: Project Management and Technical Assistance	3,000,000.00

Organizations

Borrower:	Republic of Rwanda
Implementing Agency:	Rwanda Agriculture and Animal Resources Board (RAB)

PROJECT FINANCING DATA (US$, Millions)

Maximizing Finance for Development

Is this an MFD-Enabling Project (MFD-EP)? Yes

Is this project Private Capital Enabling (PCE)? Yes

SUMMARY

Total Operation Cost	**23.00**
Total Financing	**23.00**
Financing Gap	**0.00**

DETAILS

World Bank Group Financing

Non-World Bank Group Financing

Commercial Financing	3.00
Unguaranteed Commercial Financing	3.00
Trust Funds	20.00
Global Agriculture and Food Security Program	20.00

Expected Disbursements (US$, Millions)

WB Fiscal Year	2024	2025	2026	2027
Annual	2.23	5.95	6.87	4.63
Cumulative	2.23	8.18	15.05	19.68

PRACTICE AREA(S)

Practice Area (Lead)
Agriculture and Food

Contributing Practice Areas
Health, Nutrition & Population

SYSTEMATIC OPERATIONS RISK- RATING TOOL (SORT)

Risk Category	Rating
1. Political and Governance	Moderate
2. Macroeconomic	Substantial
3. Sector Strategies and Policies	Low
4. Technical Design of Project or Program	Moderate
5. Institutional Capacity for Implementation and Sustainability	Moderate
6. Fiduciary	Moderate
7. Environment and Social	Substantial
8. Stakeholders	Low
9. Other	
10. Overall	Moderate

POLICY COMPLIANCE

Policy

Does the project depart from the CPF in content or in other significant respects?

[ ] Yes [✓] No

Does the project require any waivers of Bank policies?

[✓] Yes [ ] No

Have these been approved by Bank management?

[✓] Yes [ ] No

Is approval for any policy waiver sought from the Board?

[ ] Yes [✓] No

ENVIRONMENTAL AND SOCIAL

Environmental and Social Standards Relevance Given its Context at the Time of Appraisal

E & S Standards	Relevance
ESS 1: Assessment and Management of Environmental and Social Risks and Impacts	Relevant
ESS 10: Stakeholder Engagement and Information Disclosure	Relevant
ESS 2: Labor and Working Conditions	Relevant
ESS 3: Resource Efficiency and Pollution Prevention and Management	Relevant
ESS 4: Community Health and Safety	Relevant
ESS 5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	Relevant
ESS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	Not Currently Relevant
ESS 7: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	Not Currently Relevant
ESS 8: Cultural Heritage	Relevant
ESS 9: Financial Intermediaries	Not Currently Relevant

NOTE: For further information regarding the World Bank's due diligence assessment of the Project's potential environmental and social risks and impacts, please refer to the Project's Appraisal Environmental and Social Review Summary (ESRS).

LEGAL

Legal Covenants

Sections and Description

Conditions

Type	Citation	Description	Financing Source

I. STRATEGIC CONTEXT

A. Country Context

1. **Rwanda is one of Africa's fastest growing economies and has set high goals for continued economic development.** For the past 26 years, Rwanda has seen an average annual Gross Domestic Product (GDP) growth of 7.78 percent[1]. The largest sector is the service sector, contributing 47 percent of GDP, followed by agriculture (25 percent, 2022.)[2] and manufacturing (21 percent)[3]. Rwanda's vision is to become an upper-middle income Country by 2035 and a high-income Country by 2050, which requires an annual growth rate that exceeds 12 percent. The World Bank also estimates that for Rwanda to reach middle-income status, private sector investments need to almost triple, from 13 percent of GDP in 2023 to 32 percent of GDP in 2035. Demographically, Rwanda is a young country with about half the population being under 20 years[4] therefore job creation, especially for young people, is also key for continued growth.

2. **However, the recent outbreak of Corona Virus-19 (COVID-19) pandemic pushed Rwanda's economy into its first contraction since 1994 and the country is since on a slower growth trajectory, faced by multiple challenges.** The GDP in real terms dropped to -3.4 percent in 2020, compared to an expansion of 8 percent anticipated before the COVID-19 outbreak[5]. In comparison with 2018, the food security situation in Rwanda deteriorated by 2 percent[6]. The current global food, fuel, and fertilizer prices, driven in large part by the fallout from the ongoing war in Ukraine and the sanctions imposed on Russia[7] has negatively impacted Rwanda's recovery and led to dramatic price increases. Driven by increasing fuel and fertilizer prices in combination with a poor growing season Rwanda is currently experiencing the 7th highest food inflation in the world[8]. Overall inflation increased, mostly driven by the drastic rise in food crop prices. The Consumer Price Index (CPI) since April 2022 increased by 28.4 percent (35.9 percent in rural areas) on an annual basis[9] affecting the purchasing power of most Rwandans more, especially poor households.

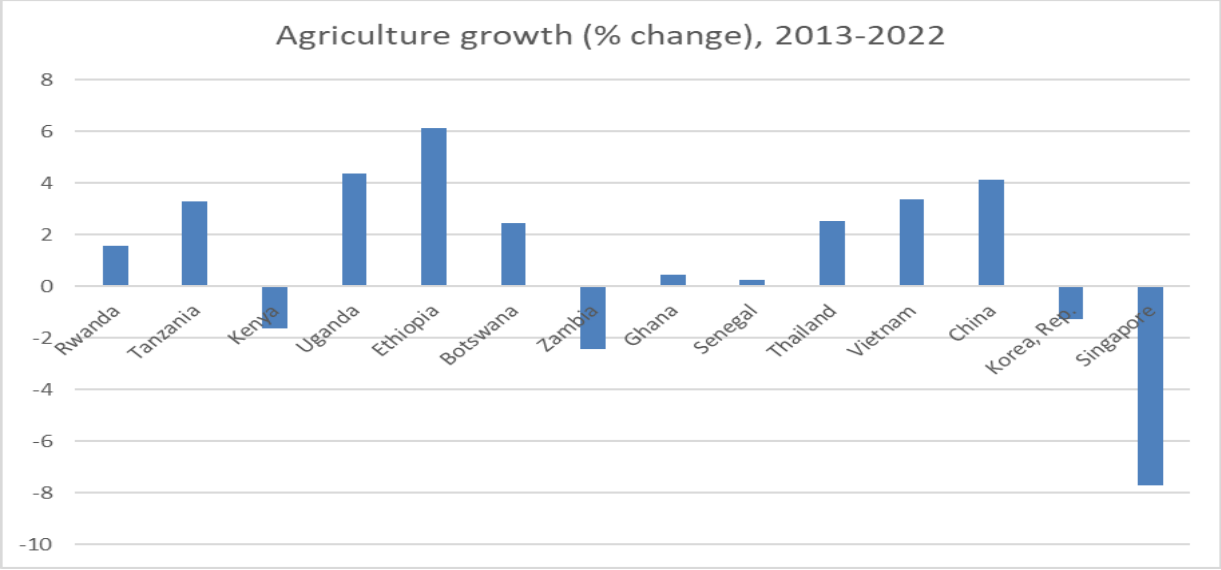
B. Sectoral and Institutional Context

3. **The agriculture sector is at the center of the Rwandan economy and the country's growth strategy is in part based on the expected transformation of the agriculture sector; nevertheless, productivity needs to increase significantly for the sector to continue to be one of the main drivers of growth and real income opportunities**. 82 percent of Rwanda's population lives in rural areas, 69 percent of all households are engaged in crop or livestock production, and the sector engages 55 percent of the labor force and almost 80 percent of the female labor force[10]. Ranking second in size in the economy, behind the service sector, the agriculture sector dominates Rwanda's exports, accounting for about 50 percent of total exports. Farming accounts for 33 percent of all new jobs created in the Rwandan economy and there are high expectations for agriculture to not just provide employment for a growing rural population but also to generate higher-quality jobs that will reduce poverty. Further, the country very much relies on domestic food production for consumption.

[1] World Bank national accounts data
[2] Rwanda Vision 2050, page 9
[3] GDP National Accounts, NISR, 2022, page 5
[4] Gender and Youth Mainstreaming Strategy, 2019, page 26
[5] GDP National Accounts, 2020, page 6
[6] Comprehensive Food Security & Vulnerability Analysis, CFSVA, 2021, page vi
[7] Rwanda: Impacts of the Ukraine and global crises on poverty and food security), page i
[8] Consumer Price Index, NISR, May 2023, page 1
[9] World Bank Food Security Updates of October 27, 2022, page 13
[10] WFP Rwanda Country Brief, April 2023

4. **Nevertheless, the transformation in agriculture needs to build on competition and innovation and achieving higher productivity rates through private sector-led investment and development.** Productivity remains moderate in Rwanda compared with East African averages. In recent years (2022-23), average productivity of major crops in the main agriculture seasons were 1.7 tons/ha for maize, 0.98 tons/ha for beans, 8.2 tons/ha for Irish potatoes, 0.63 tons/ha for beans, 6.3 tons/ha for Irish potatoes, 8.1 tons/ha for vegetables, and 6.3 tons/ha for fruits products[11]. However, these numbers remain below regional averages, and range between three to six times less compared to regional countries with the best productivity levels. Prices for fertilizers have increased significantly, which has led to less fertilizer use and less food production. Between 2017 and 2021, fertilizer prices increased by about 26 percent for Urea, and about 16 percent for DAP[12] and NPK 17-17-17[13]. DAP and Urea prices almost doubled in just one year, between 2021 and 2022, and more than doubled for NPK, with an increase of about 115 percent. As a result, the use of inorganic fertilizers was reduced by more than 2 percent in one year[14] after an increase of over 10 percent in the previous 5 years. The price of fuel has also increased drastically and has led to high transport costs that impact food imports and distribution within the country. Together with market driven research and seed systems, an increased private sector engagement will be important to drive the necessary transformation of the agricultural sector. More private sector investments are needed both on and off-farm in the agri-food sector. Experience from the Global Agriculture and Food Security Program (GAFSP) funded and World Bank administered Sustainable Agriculture Intensification and Food Security Project (SAIP) (P164520) hereafter referred to as SAIP I has shown that where smallholder farmers organizations had strong market arrangements with agribusinesses; off-takers and processors, it facilitated better access to inputs and extension services, increased use of irrigation and greenhouse farming; which had a positive effect on productivity levels, increased value addition opportunities, and farmers generated revenues.

Figure 1: Agriculture Growth 2013-2022 (percent)



[11] NISR, Seasonal Agricultural Survey, Season A 2023
[12] Diammonium Phosphate is a phosphorus and nitrogen-based fertilizer for plant nutrition.
[13] an all-purpose fertilizer containing a balanced blend of nitrogen, phosphorous and potassium.
[14] Seasonal Agriculture Surveys, NISR, 2021, 2022

5. **Continued agricultural growth will also depend on the expansion of irrigation, water use efficiency and sustainable intensification of good agriculture practices.** Rwanda is one of the most densely populated African countries, and access to farmland has deteriorated markedly due to demographic pressure and slow transition from farm to off-farm livelihoods. The share of households with less than 0.3 hectares of land has increased by about 10 percentage points from 2011 to 2017[15]. Area growth has been a major driver of agriculture growth in the past, and productivity increases are necessary for sustained growth. Irrigation is a key component for this, in particular with climate variability being increasingly visible. Rainfall patterns are highly variable and with climate change long-lasting dry spells are projected to increase by the end of the century. Nevertheless, annual rainfall is expected to increase, especially in the main rainy season in December to April, but with drier periods from July to September. Overall, Rwanda's water balance is expected to increase[16]**.** Only about 68,000 ha of land are irrigated against a potential 500,000 ha[17] out of 1.37 million hectares of land used for agriculture production[18]. Only 10 percent of households used any irrigation in 2017, and two thirds of them relied on traditional methods. There are also large gender discrepancies with regards to access to irrigation, with only 6.4 percent of women having access compared with 11.5 percent for men, which contribute to the 12 percent gender productivity gap in agriculture[19]. Although a general perception seems to be that women do not grow irrigated crops, representation in Water User Associations (WUAs) has been identified as a key impediment to women's access to irrigation. Promoting the uptake of Small-Scale Irrigation Technology (SSIT) is an integral part of the Government of Rwanda's (GoR) strategy and program. The main constraining factors for smallholder farmers to develop irrigation is access to finance, followed by access to knowledge and technology[20]. For women, this is particularly relevant as the gender gap to access finance is notable (18 percent compared with 23 percent for men)[21]. However, funding has been limited. Similarly, ensuring water use efficiency and adequate management capacity of existing WUAs is key for the future sustainability of existing irrigation systems, including those invested in under the former GAFSP financed and World Bank administered Land Husbandry, Water Harvesting, and Hillside Irrigation Project (LWH) (P114931).

6. **The decrease in food insecurity has stagnated, malnutrition remains high, and building human capital for future competition faces challenges.** After a period of declining food insecurity, the lower-than-normal harvests and food price increases resulted in a 2 percent increase in food insecurity since 2018. In 2021, 20.6 percent of the Rwandan population was food insecure (of which 1.8 percent was severely food insecure) [22]. Wasting rates among children under 5 years increased slightly, from 2 percent to 2.4 percent in this same period. About two-thirds of the food consumed by households is bought at markets, and the rest from own farm produce or other sources. For the poorest segments of the population, food expenditures constitute a significant share of their incomes, with a quarter of Rwandans spending almost two thirds of their incomes on food and a stunning 88 percent of Rwandans cannot afford a healthy diet[23]. Cereal, roots, and tubers account for more than 50 percent of the diet, fruits and vegetable consumption is below the recommended intake and domestic supply of livestock sourced food is low. As a result, malnutrition is still prevalent even though Rwanda has taken big strides in fighting malnutrition. Childhood stunting decreased from 48 percent in

[15] Systematic Country Diagnostic, World Bank, 2019
[16] Rwanda Climate Risk Profile, World Bank (https://climateknowledgeportal.worldbank.org/sites/default/files/2021-09/15970-WB_Rwanda%20Country%20Profile-WEB.pdf
[17] Irrigation Master Plan, 2019
[18] 2023A Seasonal Agriculture Survey, National Institute of Statistics of Rwanda (https://www.statistics.gov.rw/publication/1930), 2023
[19] Rwanda Agriculture Gender and Youth Mainstreaming Strategy, 2019, and Assessing the Implementation, Accountability of "Gender and Youth mainstreaming strategy in agriculture 2019-2026", 2021
[20] World Bank Farmer Led Irrigation Development FLID Report, 2021
[21] Rwanda Agriculture Gender and Youth Mainstreaming Strategy, 2019, and Assessing the Implementation, Accountability of "Gender and Youth mainstreaming strategy in agriculture 2019-2026", 2021
[22] WFP Comprehensive Food security and Vulnerability Analysis (CFSVA, 2021)
[23] Food Prices for Nutrition Database

2000 to 32.4[24],[25]. Rwanda's work force is young and 77 percent of that is under 34 years old and lives in rural areas. Less than 20 percent of the population have attended high school or above, and less than 1 percent have attended a vocational school.

7. **The impacts of COVID-19 and the ongoing war in Ukraine, in combination with the effects of climate change are seen as the most imminent challenges currently in Rwanda. In 2021, the country developed the Rwanda Economic Recovery Plan (RERP) to address some of the impacts of these challenges.** Specifically in the Agriculture sector, a priority of the plan is to: "Ensure food self-sufficiency by increasing agricultural production." The RERP provides among other things for concerted effort in seasonal crop intensification, partial subsidies for agricultural inputs and Irrigation equipment, maintenance and rehabilitation of marshlands, support to mechanization, and increasing resources for the National Strategic Food Reserves (NSFR) to guarantee food security for the Rwandan population targeting youth and women. The plan also calls for increased national aggregation and supply capacity, subsidizing airfreight for exporters as well as supporting farmers to guarantee Rwanda horticultural exports. Domestic production has a significant impact on food prices. An analysis of monthly inflation in Rwanda shows that since 2009, peak inflation correlated with adverse weather events in 8 out of 11 cases and in all but one case was the inflation higher than at the three times under favorable weather conditions. Further, in response to the ongoing war in Ukraine and the sanctions imposed on Russia resulting in the highest food prices at a level never experienced before, the government has invested heavily in irrigation equipment, seeds and fertilizer subsidy interventions aimed at maintaining food production. Additionally, Rwanda has invested in a fuel subsidy to reduce the high transport costs impacting food importation and distribution within the country. To mitigate the impact of climate change such as short rainy seasons and prolonged dry seasons, as well as persistent delayed rains that negatively impact agriculture, the Government has invested in marshland irrigation development and rehabilitation, hillside irrigation development as well as subsidizing Small-Scale Irrigation equipment to reduce dependency on rainfall while increasing productivity.

8. **The US$32.29 million SAIP I has, since it was approved in 2018 successfully addressed many of the obstacles to the GoR's priorities and generated substantial results which the GoR intends to scale-up in current sites and scale out to new project areas to impact more beneficiaries.** The objective of SAIP I is *to increase agricultural productivity, market access, and food security of the targeted beneficiaries in the project areas.* The project finances technical assistance (TA) to cooperatives, Producer-Based Organizations (PBOs), WUAs, and small and medium scale agro-enterprises (agro-SMEs), and direct investments in on-farm and post-harvest technology. It is being implemented in nine of Rwanda's 30 districts and has already achieved significant outcomes. As of September 1, 2023, it has reached 44,104 households (96.5 percent of the end of project target), including 19,769 females, grouped into 18 cooperatives and 2,127 PBOs. The productivity of the four supported value chains (horticulture, Irish potato, beans, and maize) has increased by 22.7 percent (surpassed the target of 17 percent) and over 2,440 ha (about 84 percent of the target) has been equipped with new or improved irrigation and drainage equipment. The project's nutrition sensitive agriculture interventions have reached 231,325 people (surpassed the target of 230,000) including 133,096 females.

9. The proposed new project, hereafter also referred to as SAIP II will complement the US$300 million Commercialization and De-risking of Agricultural Transformation (CDAT) Project (P171462). Approved by the World Bank Board in April 2021, CDAT is the largest Investment Project in the World Bank's Rwanda portfolio. Its project development objective is *to increase the use of irrigation and commercialization among producers and agribusiness firms in supported value chains, and access to agricultural finance.* It seeks to expand and build on activities under SAIP. Specifically, most of the CDAT resources are allocated to investments in irrigation, value chain development, and access to finance. While CDAT draws from SAIP's approaches of strengthening producer organizations and water user

[24] Rwanda 2019-20 Demographic and Health Survey, Summary report
[25] The Food Systems Dashboard Rwanda Country Profile (https://www.foodsystemsdashboard.org/countries/rwa, accessed July 11, 2023)

associations, and linking farmers to markets, the two projects are targeting different sites. Moreover, as opposed to CDAT, which focuses on investments in public infrastructure and value addition activities, SAIP has a key role in providing TA and strengthening food and nutrition security in rural areas. To ensure complementarity and that SAIP II will not crowd out CDAT's credit line, the proposed Matching Grants Program under SAIP II will finance smaller investments.

C. Relevance to Higher Level Objectives

10. **The proposed project is aligned with the Country Partnership Framework (CPF) FY21–26** Report No. 148876-RW and SAIP's experience and lessons since the start of implementation in 2018. The CPF has five objectives, of which increased agricultural productivity and commercialization is one. In this context, modernizing the agri-food sector and increasing its responsiveness to market signals are key avenues to promote high growth. Critical elements to achieve these goals include moving up agribusiness value chains, leveraging more private sector investment, enabling the delivery of improved services and commercialization, promoting nutrition-sensitive and climate-resilient technologies and infrastructures, and policy and institutional reforms. SAIP II will integrate interventions to respond to Rwanda's priorities as detailed in the Country Climate and Development Report (CCDR) Report number 176403, on People and Resource-oriented Nature-Smart Development, actions for soil-conscious conservation agriculture, and water infrastructure development and management. The World Bank Group agri-food sector interventions under the CPF and CCDR have fully embedded these priorities to support the sector development objectives and the delivery of the GoR's Fourth Strategic Plan for Agricultural Transformation (PSTA-4) results.

11. **SAIP II will continue to support the national strategies for the agricultural sector as reflected in the National Strategy for Transformation (NST) 2017–2024, the PSTA4 2018–2024, and the RERP.** The project will contribute to the four NTS pillars, which focus on a productive, green, and market-led agricultural sector: (a) productivity and commercialization for food security, nutrition, and incomes; (b) resilience and sustainable intensification; (c) inclusive employment and improved farmers' skills; and (d) an effective enabling environment and responsive institutions. Further, the project will contribute mostly to two PSTA4 priorities: (i) productivity and commercialization for food security, nutrition, and incomes; and (ii) resilience and sustainable intensification. Additionally, the project will contribute to the RERP objectives of crop intensification, support to strategic food security crops such as maize and beans, financial support to small-scale irrigation equipment, increased aggregation and supply capacity, and investments in the horticulture supply chain.

12. **The proposed project is consistent with Rwanda's climate strategies and the Paris Agreement (PA) commitments**. The project design is well aligned with the 2020 update of Rwanda's Nationally Determined Contribution (NDC). The agriculture sector commitments towards mitigation measures and adaptation interventions are fully aligned with the objectives of the National Agriculture Policy, and delivery strategies outlined in the PSTA4. In the latest NDC submitted to the United Nations Framework Convention on Climate Change (UNFCCC), Rwanda commits to a reduction of 16 percent relative to the Business-as-usual (BAU) baseline in 2030 in the unconditional pathway, and an additional 22 percent decrease with international support. In total, this is a combined unconditional and conditional contribution of 38 percent reduction in Greenhouse Gas (GHG) emissions compared to BAU in 2030, equivalent to an estimated mitigation level of up to 4.6 million tons of carbon dioxide equivalent (tCO2e) in that year. Among the planned mitigation measures, SAIP II will contribute to soil conservation measures and livestock management measures, which in the NDC account for at least half of the agriculture sector's potential. These include conservation tillage, multi-cropping and crop rotation practices, and improved fertilizer efficiency (including compost production and use). Findings from the climate and disaster risk screening (CDRS) conducted for SAIP II reveal that rainy seasons are becoming shorter and more intense, which has resulted in increased erosion and floods risk in the mountainous areas of the country's northern and western provinces. The screening also showed that frequent rainfall deficits and prolonged seasonal droughts are expected, which

will cause problems especially in the east and southeast of the country. Rwanda's adaptation contribution prioritizes 24 adaptation interventions in different sectors, and among these, 6 are in agriculture. The proposed project will directly integrate four of them in its interventions for crop related interventions: (i) develop climate resilient crops and promote resilient livestock (by promoting drought tolerant and disease resistant seed varieties in targeted value chains); (ii) develop climate resilient post-harvest and value addition facilities and technologies; (iii) strengthen crop management practices; and (iv) expand irrigation and improve water management. SAIP II will also indirectly contribute to the remaining two interventions of: (v) expansion of crop and livestock insurance (by mobilizing its beneficiaries to leverage crop insurance products supported by the CDAT project - P171462); and (vi) developing sustainable land use management practices (by promoting and supporting sustainable operation and maintenance practices in irrigated and terraced watershed areas used by beneficiaries). All these interventions fully align with Rwanda's Green Growth and Climate Resilience Strategy (GGCRS)[26], which aims to transform the country into a developed, climate-resilient, and low-carbon economy by 2050. The strategy has among its key objectives to achieve sustainable land use and water resource management that results in food security, preservation of biodiversity and ecosystem services. The above measures and interventions are also aligned with the Rwanda CCDR priorities on increasing agriculture's resilience to climate change. For successful implementation of related activities, the CCDR calls for agronomic information extension and training of farmers which will be one of the key project interventions to reach its development objectives.

II. PROJECT DESCRIPTION

A. Project Development Objective (PDO)

PDO Statement

13. To increase agricultural productivity, market access, and food security of the targeted beneficiaries in the project areas.

PDO Level Indicators

14. **The final project outcomes will be assessed through the PDO, and intermediate-level indicators as detailed in the Results Framework (RF).** The PDO-level indicators are the following:

a. Percentage increase in harvested yield of targeted crops.
b. Percentage increase of produced commodities in targeted value chains marketed by participating producers.
c. Food Consumption Score.
d. Number of farmers adopting improved agricultural technology, disaggregated by gender.

B. Project Components

15. SAIP II will be a continuation of SAIP I, which has been under implementation since December 2018 and is scheduled to close in August 2024. SAIP II will consolidate the results and scale-up the ongoing SAIP I activities under four major nutrition-sensitive value chains: (a) vegetables and fruits for domestic, regional, and international markets; (b) maize for domestic and regional markets; (c) Irish potato for domestic and regional markets; and (d) beans for domestic

[26] The Rwanda's Green Growth and Climate Resilience Strategy was initially developed in 2011, and was updated in June 2023 (Overview here: https://www.environment.gov.rw/index.php?eID=dumpFile&t=f&f=69695&token=adb3cc9f417d1562b9b20aa2b2ee99b0abaa8a5e)

markets. These value chains were selected based on: (a) market and growth potential (unmet demand, potential for productivity gains, and value addition); (b) relevance and development impact (nutrition improvement, opportunities for on- and off-farm employment, and income-generation potential); and (c) reflection of strategic factors (national priority crops) and potential impact of the project and feasibility for change. SAIP II will maintain the four SAIP I components. It will also integrate lessons learned from SAIP I implementation to ensure efficiency, and achievement of enhanced results.

Component 1: Institutional Strengthening, Agriculture Productivity Enhancement, and Nutrition Improvement (US$6.81 million)

16. The component will strengthen selected farmer organizations for improved agricultural productivity and healthier household nutrition. Specifically, the project will work closely with youth groups to serve as service providers for specific activities. Further, it will support farmers to shift from subsistence to commercial oriented agriculture. Replicating the approach under SAIP I, the project will provide TA and support the implementation of the component with Farmer Field Schools (FFS) and farming as business (FAB) approaches. Based on lessons under SAIP I and responding to food systems, the proposed project will further strengthen existing capacity building programs in Integrated Pest Management (IPM) as well as introduce a new area in Integrated Nutrient Management (INM) and Food Quality Management (FQM). The component has three sub-components.

17. **Sub-component 1.1. Strengthening farmers' organizations.** This subcomponent will finance ongoing capacity building programs such as FAB, Cooperative Management, Entrepreneurship Development, Good Agricultural Practices (GAP), Post-harvest management, Agro-processing and Value addition and new programs including IPM, INM, FQM and Climate Smart Agriculture (CSA) practices. The project will implement specific and tailored capacity building interventions to empower youth and women's leadership and management skills. These interventions will increase their capacity for addressing identified challenges and constraints they face so that they actively participate in decision making, promote inclusion and improve their access to agricultural finance and productive services.

18. **Sub-component 1.2. Agricultural productivity enhancement.** This subcomponent will finance: (i) the development of model farms to promote the use of agricultural inputs such as fertilizers, lime, new, hybrid, drought tolerant and disease resistant seed varieties, with high market demand for crop commodities produced down the value chain, agroforestry management, and other good agricultural practices; (ii) matching grants and TA to private actors and producer organizations for seeds production; (iii) matching grants for investments in on-farm mechanization across value chains; (iv) awareness and capacity building for farmers and producer organizations to access available agriculture finance and agriculture insurance products; and (v) matching grants to finance protected agriculture. Specific windows of the matching grant facility will be created for women, youth, and vulnerable groups to address their specific challenges that limit agricultural productivity. Interventions will also include the promotion and support of conservation agriculture practices, including the maintenance of areas developed with sustainable land management.

19. **Sub-component 1.3. Improving nutrition outcomes at household level.** This subcomponent will improve nutrition outcomes at household level among beneficiary households by: (i) raising awareness on utilization benefits of nutritious foods (including fruits and vegetables) to improve dietary diversity through Social Behavior Change Communications (SBCC), capacity building (information on relevant foods like soy and mushrooms) and cooking demonstrations for communities in partnership with the Government's Community Health Workers (CHWs); and (ii) promoting post-harvest storage and management, food preservation and utilization. For the poor and vulnerable households in targeted areas, the Project will finance interventions to: (iii) increase availability of diverse plant-based food, including biofortified crops, mushrooms and fruits; and (iv) ensure availability of animal protein for household consumption.

Component 2: Irrigation and Water Use Efficiency (US$6.19 million)

20. Component 2 will finance small-scale irrigation, water use efficient technologies within existing irrigated schemes, and strengthening of irrigation capacity to promote climate-smart agriculture. The project will target smallholder farmers, extension workers, and irrigation scheme managers, particularly those in vulnerable agroclimatic areas, to help improve their resilience to climate variability, increase their crop productivity and profitability, and promote sustainable agricultural practices. Implementation of the sub-component will integrate the diagnostic findings of "Catalyzing Small-scale Irrigation Development in Rwanda: An Assessment of the Small-Scale Irrigation Technology (SSIT) Program" (March 2022) and some of its key recommendations. Details are provided in Annex 2.

21. **Sub-component 2.1. Support Climate Smart and Efficient Irrigation Interventions.** This subcomponent will finance CSA technologies to help targeted farmers cope with the impact of climate change. This includes access to affordable and sustainable irrigation technologies, and provision of matching grants for small-scale irrigation equipment in line with the GoR's subsidized SSITs Development Program. The SSITs will follow climate-resilient design standards and energy-efficiency considerations such as solar powered water pumps for small-scale irrigation to maximize the project's adaptation and mitigation climate co-benefits, respectively. As per the Government SSIT guidelines, beneficiaries will include individual farmers or groups of farmers owners of consolidated areas covering between 0.5 hectares and 10 hectares. If SSIT beneficiaries are farmer organizations, Subcomponent 2.2 will support the establishment and training of WUAs.

22. Based on the SAIP I experience, SAIP II aims to enhance the scalability of successful technologies and practices to improve water use efficiency within existing irrigation schemes, primarily built by previous projects such as the LWH and RSSP, by targeting at least an additional 600 hectares to SAIP I achievements. Moreover, the Project will facilitate access to small-scale irrigation equipment for farmers by offering matching grants and comprehensive support packages, including maintenance assistance and the development of business plans. As a result, an additional 1,000 hectares of agricultural land will be able to benefit from the utilization of SSITs and techniques. The project will include interventions to improve the SSIT program efficiency in both its administration and in costs borne by farmers. More details are provided in Annex 2.

23. **Sub-component 2.2. Strengthen irrigation management capacity.** The Project will follow guidance from the Ministry of Agriculture and Animal Resources (MINAGRI's) new Irrigation Development Strategic Plan to introduce improved irrigated agricultural management. This subcomponent will finance on-farm training in the handling, assembling, and proper use of different irrigation equipment to improve adaptation rates and improve irrigation practices among farmers. It will facilitate the establishment of new WUAs for farmers applying for SSIT technologies in groups for their consolidated land, strengthen the organizational capacity and governance of existing ones, and train WUAs and farmer groups on water management, irrigation system operation and maintenance, and irrigation service fee collection, in existing irrigated schemes. Women and vulnerable groups, such as old and disabled farmers, which are currently under-represented will be specifically targeted through sensitivity and capacity training to promote their participation in WUAs and farmer groups. Through a specific program, local youth will be trained in various skills to facilitate the community to sustainably manage the irrigation schemes.

Component 3: Market Linkages and Value Addition Investments Support (US$4.0 million)

24. As a consolidation and scale-up of efforts undertaken by the LWH, third Rural Sector Support Project (RSSP3) (P126440) and SAIP I, component interventions will enhance market linkages and value addition by strengthening the capacity of farmer organizations and other value chain actors and improving their access to finance.

25. **Sub-component 3.1. Capacity building to foster market linkages.** The subcomponent will finance training to improve the capacity of farmers' organizations and value chain actors to reduce postharvest losses and enhance the quality of produce, and facilitate linkages to both domestic, regional and international markets. Key interventions will include training for beneficiaries to improve food quality and safety, and TA to meet required certification standards to ease access to domestic and export markets. Interventions will also aim to improve the organization of local traders in different value chain platforms as well as strengthen linkages between producers and buyers. The TA will complement these to improve food safety, such as the elimination of aflatoxin contamination, and overall quality enhancement in all stages of food products processing, packaging, and preservation. These interventions will directly be linked with activities under component 1, to support business planning skills development for targeted beneficiaries. The Project will create awareness and build capacity for beneficiaries to leverage available access to finance opportunities, including those offered under the CDAT project. The Project will also assist beneficiaries in the dialogue with Financial Institutions, particularly cooperatives borrowing for being able to aggregate produce from member farmers.

26. **Sub-component 3.2. Investment support to market linkages.** Through matching grants, the project will continue to finance private investments in assets to enhance market linkages and value addition activities. Eligible investments will be demand driven and market oriented, and include among others drying facilities, collection centers, storage and cold chain equipment, and processing facilities. The matching grants program will enable beneficiaries, both individual and organizations, to access finance based on business plans, including joint business plans between producers and off-takers.

Component 4: Project Management and Technical Assistance (US$3.0 million)

27. This component will finance project management, knowledge management and dissemination, and TA.

28. **Subcomponent 4.1: Project management.** This sub-component will ensure smooth project implementation. As such, it will finance all aspects of project management and operating costs including: (i) project staffing, their coordination and training; (ii) monitoring and evaluation (M&E); (iii) communication and knowledge sharing; (iv) TA; and (v) environmental and social risk management, including a grievance redress system (GRS).

29. **Subcomponent 4.2: Knowledge Management and Dissemination**. Developing knowledge products and disseminating know-how is an important part of this component. Activities include: (i) develop and disseminate knowledge products, including technical manuals, guidelines, and training material on the new technologies and practices; (ii) organize knowledge-sharing events, including study tours, workshops and field days, to exchange and disseminate new knowledge products and promote the adoption of the new technologies and practices, and; (iii) facilitate the exchange of knowledge and experiences between project staff, farmers, extension workers, and researchers on the new technologies and practices.

30. **Subcomponent 4.3: Technical Assistance.** This component will fund additional TA to improve project performance, incorporate best agriculture and household level nutrition improvement practices, and document lessons learned. The TA will also focus on integrating FAB practices at all levels of the Project's extension services, and across all supported value chains. The Project will build on lessons learned from international best practices and focus on three specific technical areas; (a) integrate farming as a business approach in the Project extension services and capacity building programs to improve market linkages, (b) the use of digital services to improve access to extension services and markets, and (c) nutrition outcomes improvement.

C. Project Beneficiaries

31. The proposed project will be implemented in the current 9 SAIP I districts[27] (Rwamagana, Kayonza, Gatsibo, Ngoma, Nyanza, Rulindo, Karongi, Rutsiro and Nyabihu) and in an additional 11 new districts (Kamonyi, Huye, Ruhango, Muhanga, Gisagara, Nyamagabe, Bugesera, Rusizi, Nyagatare, Kirehe and Ngororero). The new districts were selected based on the following criteria: (i) risks and shocks arising from erratic rainfall and periodic droughts in the Eastern and Southern parts of the country (Bugesera, Nyagatare, Kamonyi, Huye, Ruhango and Muhanga Districts are semi-arid areas); (ii) districts with high levels of stunting and children with malnutrition (Gisagara, Nyamagabe and Ngororero Districts); and specific interventions & value chain preferences (Rusizi for fruit trees intensification).

32. Targeted beneficiaries will remain smallholder farmers (some of whom have been mobilized into farmer organizations, WUAs, Self-Help Groups [SHGs], and cooperatives), and agro SMEs in the selected sites. SAIP II investments, TA, and/or nutrition-sensitive agriculture interventions will directly benefit an additional 20,000 new households or approximately 70,000 new individuals of which at least 42 percent will be women. This is a 44 percent increase from SAIP I to SAIP II (45,688 to 65,688 households). During implementation, continued emphasis will be on identifying and providing opportunities for income-generating activities for women and youth, ensuring women and youth participation and leadership in the SHGs and cooperatives, and targeting vulnerable groups. Beneficiaries will include value chain actors including entrepreneurs and small and micro agri-businesses, working in the selected value chains, and supported through the Project's matching grant program. Communities in the target areas at large will also indirectly benefit from the project through investments in Savings and Credit Cooperatives (SACCOs), post-harvest and agri-processing equipment, market linkages and improved nutrition (through awareness on utilization of nutritious foods). However, the Project will target poor and vulnerable households in target areas for specific interventions to increase their uptake of a diverse diet and consumption of nutritious food. Such activities will include (i) the distribution of planting materials of nutritious plant-based food, and (ii) availing animal protein for their consumption.

D. Results Chain

33. **The SAIP II theory of change (ToC) will adopt the SAIP I ToC.** It maintains the 3 transformative pathways to achieve the expected end-results of improved livelihoods, food and nutrition security of targeted beneficiaries through increased agricultural productivity, value addition, and access to markets in an environmentally sustainable way.

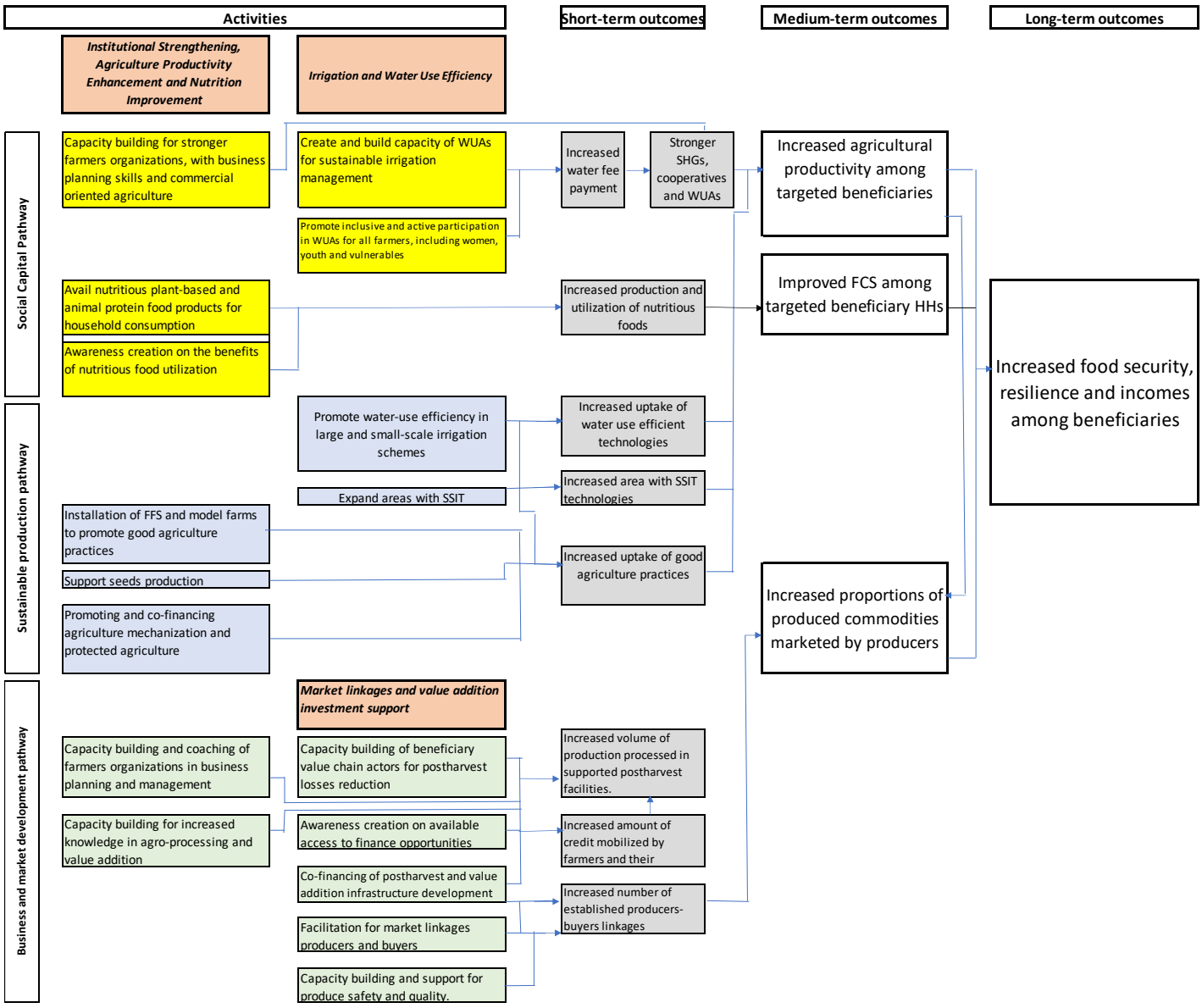
a. **Under the social capital pathway,** socio-economic institutions such as farmers' organizations, SHGs, Cooperatives, WUAs, unions and commodity associations are considered key to sustainable and inclusive agricultural development. Groups in the targeted project areas will receive support to strengthen their organizational and managerial capacities to help them to become strong, well-organized, well-managed professional and financially independent institutions, able to provide services and added value to their members, and to reach a level where can be the engines of their own development without dependence on external assistance.
b. **The sustainable production pathway** focuses on the key transformative changes needed for environmentally sustainable and resilient production and productivity increases. Rwanda's very high population density on mostly hilly agricultural land has resulted in high erosion levels and subsequent soil degradation which has been further exacerbated by climate change challenges. The project will continue to finance the consolidation and upscaling of techniques to enhance the resilience and diversification of production systems among the various groups of

[27] selection criteria included food security and nutrition potential; market potential and access; cooperative/groups readiness; market access; agronomic suitability; and potential for productivity gains.

farmers organizations.

c. **The business and market development pathway** concentrates on building inclusive and durable market linkages through which strong and self-reliant cooperatives can sell increased volumes of produce. SAIP II will continue to strengthen the role of cooperatives in business and market development, while simultaneously building their capacity. It will finance investments in improving post-harvest processes and value addition to support the production of consistently good quality products. The Project will also create awareness among beneficiaries on access to finance opportunities and build their capacity to be able to leverage them for the purpose of professionalizing and expanding their operations.

Figure 2: Theory of Change diagram



E. Rationale for World Bank Involvement and Role of Partners

34. The World Bank can leverage its unique cross-sectoral expertise mix and experience in providing technical support to Governments for preparing and implementing programs and projects aimed at poverty reduction, service delivery, policy development, including through agriculture, which are well recognized in Rwanda. Through this partnership, the GoR has implemented its flagship programs for irrigation development, sustainable land management interventions, and agriculture value chains development, and recently, in deploying resources to avail affordable agriculture private financing and de-risking instruments. For over two decades, the World Bank has supported the GoR in agriculture and private sector engagement policy development and dialogue. It is the current supervising entity for SAIP I on behalf of GAFSP. The World Bank is therefore well positioned to continue to administer the GAFSP financing, and provide the implementation support for this operation, which is a natural continuation of the SAIP I.

35. The GoR will select a service provider to lead the TA activities which are designed to strengthen the capacities of the targeted project beneficiaries, integrate FAB practices across all agriculture activities by the beneficiaries, and enhance the effectiveness of the project interventions. The TA will continue to emphasize knowledge management and support coordination among stakeholders. To ensure sustainable irrigation interventions, SAIP II will also incorporate recommendations from the recently prepared National Irrigation Strategic Plan prepared with support from the Japan International Cooperation Agency (JICA), and guidance from the diagnostic findings of the "Catalysing Small-scale Irrigation Development in Rwanda: An Assessment of Small-Scale Irrigation Technology (SSIT) Program" study, developed with support from the World Bank's Water Global Practice. The Project will also leverage access to finance and de-risking products offered by the World Bank's funded CDAT project to expand and sustain SAIP II beneficiaries' agribusiness investments. SAIP II will also benefit from CDAT interventions to improve seed systems.

F. Lessons Learned and Reflected in the Project Design

36. **The project design builds on the approach and target groups of and focuses on further consolidation of results and sustainability of previous projects.** The project builds on and is consolidating the results of past World Bank projects: RSSP3 (P126440); LWH (P114931), SAIP I (P164520) and other schemes developed by MINAGRI. As a follow-on complementary operation, SAIP I was also designed to address some of the unmet challenges under the RSSP and LWH (water use efficiency, access to finance, connectivity to regional markets) to achieve higher results and greater impact for additional beneficiaries, with targeted involvement of youth and women.

37. The implementation of SAIP I has been highly satisfactory overall. Throughout implementation, valuable lessons were learned, and these insights were utilized to make necessary adjustments, resulting in further enhancement of the results. SAIP demonstrated that implementing inclusive interventions can help address constraints faced by certain groups, such as youth and women, leading to improved results and expanding economic prospects. Project implementation also confirmed that strong market linkages could facilitate better access to inputs and private sector led extension services, and therefore contributing to increased productivity and revenues. Model farms, which are a comprehensive type of demonstration plots, were one of the factors contributing to increasing market linkages in addition to promoting good agriculture practices. The first 3.5 years of SAIP I showed that extensive and focused mobilization of farmers is crucial to increase the uptake of sustainable irrigation technologies. Other lessons learned indicate that farmers prefer solar-powered pumps for SSIT over diesel fuel systems due to reduced operating costs and other reasons. Additionally, enhanced capacity-building programs for operation and maintenance are critical to ensure the sustainable use of these technologies. More details on the lessons from the first SAIP can be found in Annex 6.

III. IMPLEMENTATION ARRANGEMENTS

A. Institutional and Implementation Arrangements

38. **The SAIP I institutional and implementation arrangements remain in place for SAIP II**. The Rwanda Agriculture Board (RAB) will continue to oversee coordination of overall project implementation through its existing Single Project Implementation Unit (SPIU). RAB is a non-commercial public institution with administrative and financial autonomy under the supervision of MINAGRI. The SPIU has a strong team (technical, financial, procurement, safeguards, monitoring and evaluation) with extensive experience in implementing and managing World Bank funded projects. The SPIU will continue to receive strategic guidance from a Project Steering Committee (PSC) made up of several stakeholders including various ministries and other relevant agencies, representatives of Farmers' Organizations, etc.

B. Results Monitoring and Evaluation Arrangements

39. **The project will use the existing SAIP I Monitoring & Evaluation (M&E) design and framework.** Its key elements are: (a) the project's Theory of Change; (b) cascading Results Framework (RF) and M&E strategy to operationalize the RF; and (c) compliance with the GAFSP/World Bank Group requirements which include core indicators and specific indicators for food security, nutrition and gender. The M&E system will assess actual change against stated objectives.

40. **The project outcomes and impacts will be assessed through PDO, and intermediate-level indicators as reflected in the RF.** The SPIU will be responsible for data collection and consolidation, quality control, analysis, and reporting. Annual monitoring reports will be used by the SPIU in the preparation of annual work plans and budget and by implementation support missions to track project progress and ensure the project is on track.

41. **Baseline, midterm, and project evaluation.** Where possible, the SAIP I indicators actuals will serve as the baselines for SAIP II.

C. Sustainability

42. **The project will focus on consolidating and expanding the SAIP I results and ensuring their sustainability**. SAIP I built on the results of previous World Bank supported projects (LWH and RSSP3) was critical in identifying the technical options, organizing farmers, constructing the infrastructure, and linking farmers to markets. The proposed project provides a realistic exit strategy for the GoR by ensuring that farmers' organizations, local government institutions, and the private sector continue performing well and become drivers of development. The project will build on previous efforts to ensure that farmers' organizations will be brought to maturity and have the capacity to take over functions and services previously provided by external partners, notably Government to drive agriculture development. WUAs and cooperatives will be strengthened to have the capacity to take over the operation and maintenance of infrastructure provided by this and other investment projects. In addition, the project will document the pathways of transformation triggered by a holistic approach and document the approaches for project exit strategies. Special consideration will also be given to youth to stimulate profitable engagement in agriculture and agribusinesses, through developing skills and promotion entrepreneurship.

IV. PROJECT APPRAISAL SUMMARY

A. Technical, Economic and Financial Analysis (if applicable)

43. The project generates economic benefits from investments in development pathways related to social capital, sustainable production, and business and market development. These investments lead to development outcomes, including sustainable and strengthened farmer organizations and rural institutions, which are necessary for value chain development, sustainable and more resilient production systems, better functioning integrated value chains with cooperatives and unions, and enhanced value chains among farmers with improved access to national and regional markets, and reduced post-harvest losses that facilitate job creation and income generation. Quantification of these economic benefits is based on benefits accruing from investments along the value chain of the agricultural commodities and cross-cutting thematic area that are supported by the project, using farm and enterprise or micro processing models. The supported commodities and cross-cutting thematic areas include maize, potato, climbing beans, tomato, onion, mango, cabbage, eggplant, carrot, tree tomato, passion fruit, chili (bird-eye and hot), French beans, and avocado. The farm and micro-processing models intend to capture: (i) improved household income; (ii) increased asset accumulation; (iii) adoption of climate-resilient agricultural production; and (iv) increased market linkage for value-added produce in national and regional markets. To capture the benefits of transformational change by the project interventions, crop and farm budgets and micro-processor/enterprise models have been used to aggregate data up to the project level, using an input-output model for comparison against a base scenario without project intervention.

44. The economic analysis evaluates the project's benefits and costs to the national economy over a period of 20 years with a social discount rate of 6 percent and 12 percent for the financial analysis. The net incremental benefits are used to calculate the viability of the project using indicators such as the internal rate of return (IRR), benefit-cost ratio (BCR) and net present value (NPV). The resulting economic net present value (NPV) is about US$42.4 million, the economic internal rate of return (EIRR) is 19.6 percent, and the BCR is 3.03. Sensitivity analyses demonstrate that the project can absorb substantial negative impacts and still generate an EIRR above the social discount rate. Thus, the analysis supports the public investment decision.

45. The financial analysis indicates the NPVs of the net incremental benefits per hectare range from US$1.69 million for beans to US$28.63 million for tomatoes. Benefit-cost ratios range from 1.19 for beans to 2.37 for tomatoes. The financial performance indicators demonstrate the robustness of the crop and farm models, indicating that the proposed activities are commercially viable.

46. **Greenhouse Gas Accounting (GHG).** The project will generate some positive environmental externalities in terms of GHG mitigation (about 24320 tCO2eq per year for 20 years or 1216 tCO2eq per year, as described in Annex 4). Using the World Bank's guidance note on the shadow price of carbon in economic analysis (September 2017), the social value of these environmental benefits has been also included in the overall economic results, using the low and high estimate range for the social price of carbon.

47. **Maximizing Finance for Development (MFD).** The proposed project will promote and support the development of productive alliances between farmers' organizations and other private sector organizations, including off-takers and processors. Certain activities, such as the promotion of greenhouse farming, have moved farmers into more business-oriented activities and enabled downstream investments among off-takers, including in washing, packaging, and certified value chains. A matching grant facility will support for up to 50 percent of the cost of the acquisition of assets for postharvest management and/or value addition through sound business plans prepared individually or jointly by these value chain actors. An important part of this is the matching grant facility for SSIT, which finances 50 percent of regular

technology and up to 75 percent for solar pump technology, meaning private capital contribution of 25-50 percent per investment. The SSIT component of the Matching Grants Program generated a lot of interest under SAIP I and some 600 farmers invested in SSIT under the project. The Project will encourage beneficiaries to leverage private finance opportunities, including credit and insurance products offered under the World Bank financed CDAT and Access to Finance for Recovery and Resilience (AFIRR P175273) Projects, which both finance credit lines to the agri-food sector. This will be done primarily through awareness raising about relevant institutions and terms under which farmers and other agri-food sector actors can apply for private credit, but also through the capacity strengthening under the project on "farming as a business."

48. The Paris Agreement (PA) assessment followed the approach for assessing risks and risk reduction measures to demonstrate SAIP II alignment with mitigation and adaptation resilience goals across two main agriculture subsectors, in which the Project will be intervening: crop production and agri-food value chains. Irrigation interventions were assessed separately. As summarized below, and detailed in Annex 5, the assessment concluded that the risks the Project has included in its design mitigation are at an acceptable level for adaption, and at a low level for mitigation. The PA assessment further confirmed that the Project design incorporated risk reduction strategies in its interventions for both mitigation and adaptation. It can therefore be confirmed that the Project is well aligned with the goals of the Paris Agreement on both mitigation and adaptation aspects.

49. **Assessment and reduction of mitigation risks**: A significant number of Project activities are universally aligned (UA) in all subsectors financed by the project, and therefore contribute to climate action consistent with the pathways toward the mitigation goals of the Paris Agreement. However, there are a few activities which did not fall on the UA list, including the use of chemical agriculture inputs, GHG emitting energy sources for water pumping in irrigation, transport, waste management and refrigeration in postharvest and value addition activities. The Project design incorporated measures to promote conservation agriculture, soil testing and integrated pest management practices to ensure optimal use of inputs. The project will also incentivize solar powered water pumps and associated irrigation equipment, to increase their uptake and preference by farmers relative to the diesel systems. Interventions will also include the promotion of clean cooling in the cold chain development interventions, and sustainable waste management in processing activities supported by the Project.

50. **Assessment and reduction of adaptation risks:** Findings from the climate and disaster risk screening (CDRS) conducted for the Project reveal that rainy seasons are becoming shorter and more intense, which has resulted in increased erosion and floods risk in the mountainous areas of the country's northern and western provinces. Impacts will most likely be limited in the Project areas because of efficient drainage systems and sustainable land management practices adopted in watersheds. However, to ensure sustainability of these outcomes, Project interventions will include capacity building of farmers in the maintenance of watersheds in developed areas and support related interventions. The CDRS also showed that frequent rainfall deficits and prolonged seasonal droughts will be expected, which will cause problems especially in the east and southeast of the country. Measures taken by the project include expansion of areas with SSITs, promotion of water use efficient technologies and sustainable schemes management in irrigated areas.

B. Fiduciary

(i) Financial Management

51. **A Financial Management (FM) assessment of RAB as the main project implementing entity has been carried out in accordance with the World Bank policy and directives on Investment Project Financing (IPF)**. The assessment aims to determine whether RAB has acceptable FM arrangements to ensure: (a) project funds will be used for the intended

purposes in an effective, efficient, and economical way; (b) financial reports will be prepared in a reliable, accurate and timely manner; and (c) project assets will be appropriately safeguarded. The assessment reviewed the FM performance of SAIP I which has been satisfactory with a 'moderate' FM risk rating.

52. **The project will benefit from the Public Financial Management (PFM) reforms that Rwanda has undergone, RAB's project oversight and accountability arrangements and experience from implementing SAIP I.** The PFM system is anchored in solid legal frameworks and PFM Strategies. The Public Expenditure and Financial Accountability (PEFA) 2022 confirmed progress has been made in budget planning, expenditure efficiency, enhancement of the internal audit function, external audit coverage, and financial reporting. An acceptable project oversight and accountability structure is in place. It includes a Project Steering Committee, RAB management oversight, internal oversight bodies (internal audit and audit committee), external oversight bodies (the Office of the Auditor General) and Parliament that approves the government's budget. The SPIU has experience in implementing World Bank financed projects, one of which is SAIP I. The SPIU maintains adequate staffing and accounting systems. Financial reports and audit reports of acceptable quality are consistently submitted on time.

53. **Based on the assessment, the project FM risk is rated "Moderate".** The key risks identified are: (a) double dipping of expenditures due to the overlapping period between SAIP I and II as similar activities are implemented in both projects; and (ii) inadequate and delayed implementation of external and internal audit recommendations. **Mitigation measures have been incorporated in the project.** These are: (a) the RAB SPIU will update the current FM guidelines to incorporate the new project districts and activities; (b) the project will use the SAIP I existing matching grants manual, Project Implementation Manual (PIM) and FM Manual with the requisite updates for this project; (c) SAIP II will finance new interventions and activities in the 9 districts of SAIP I interventions only after SAIP I is closed to avoid double counting of expenditures; and (d) the World Bank will provide support and training on World Bank FM and disbursement procedures to project FM staff before effectiveness and as needed during project implementation.

54. It is the conclusion of the assessment that the current FM arrangements meet the World Bank's minimum requirement for implementing IPF operations. The FM risk rating will be monitored regularly and updated as needed. An action plan has been prepared to mitigate the risks identified.

(ii) Procurement

55. The non-financial intermediary part of the proposed project procurement will be conducted in accordance with the 'World Bank Procurement Regulations for Borrowers under Investment Project Financing,' dated November 2020, hereafter referred to as 'Procurement Regulations'. The project will be subject to the World Bank's Anticorruption Guidelines, dated July 1, 2016, and beneficiary disclosure requirements. The proposed project will use the Systematic Tracking of Exchanges in Procurement (STEP), a planning and tracking system that will provide data on procurement activities, establish benchmarks, monitor delays, and measure procurement performance. Procurement will be conducted by the RAB-SPIU procurement team.

56. As per the requirement of the Procurement Regulations, a Project Procurement Strategy for Development (PPSD) has been prepared. It sets out the selection methods to be followed by the client during project implementation in the procurement of goods, works, and non-consulting and consulting services financed by the World Bank. The associated Procurement Plan will be updated at least annually or as required to reflect the actual project implementation needs and improvements in institutional capacity.

57. In the event RAB delegates some procurement responsibilities to the community, Procurement Regulations paragraph 6.52 and Annex XII - Selection Methods paragraph 6.9 and 6.10 on Community Driven Development (CDD) will apply. The communities will be hired to conduct small and scattered works. The Community procurement is coordinated, and reports consolidated by RAB. The fiduciary assurance of community procurement shall come from citizen engagement, disclosure at community level and social audit.

58. Related criteria shall be used for all international competitive procurements to ensure sustainable procurement (Environmental, Social, Economic and Climate Change (Paris Alignment)) are taken into consideration in the procurement processes.

59. **Project procurement risks** have been assessed and the following risks identified: (i) Gap in domestic production of construction materials and irrigation equipment relative to the demand generated by Rwanda's construction sector can delay the completion of works and award high cost contracts; (ii) Environmental risk: the risk associated with the external forces from the surroundings or environment, these are uncontrollable events (Example: Floods); (iii) Financial risk: bankruptcy and currency exposure. **Recommended mitigation measures** are: (a) Quantify and indicate the total estimated quantities of materials that will be needed so that the successful bidders order materials/equipment early on at once rather than making frequent purchases. Starting the procurement process early to allow contractors ample time to know where to get the required construction materials and equipment, using an international market approach and encouraging contractors to employ local labor with necessary skills will ultimately reduce reliance on expensive foreign experts; (b) Promotion of high technology in land protection and intensive/extensive work during the dry season rather than rainy season; (c) Deep analysis of bidders' financial capability and introducing a risk transfer (insuring against risk) mechanism. The project will continue to finance investments and agricultural inputs to support improved productivity. The procurement activities in general are considered relatively low risk.

60. Currently RAB is implementing the SAIP I and CDAT Projects. The SPIU has three (3) full-time qualified procurement specialists, and they have technical capacities to manage SAIP-II project procurement, in addition to their current workload.

61. Based on risks and gaps identified, the project procurement risk is rated "**Moderate**". With implementation of the above recommended mitigation measures the risk can be revised to "**Low**" during project implementation. The Procurement Risk Assessment and Management System (PRAMS) for the Appraisal stage was done on July 02, 2023, and the procurement performance risk is rated "**Moderate**".

C. Legal Operational Policies

Legal Operational Policies	Triggered?
Projects on International Waterways OP 7.50	Yes
Projects in Disputed Area OP 7.60	No

D. Environmental and Social

Environmental Safeguards

62. The SAIP II environmental risk rating is "**Substantial**" under the new World Bank Environment and social Framework (ESF) and standards. The rating is based on the nature of planned activities under components 1, 2 and 3 that will impose both positive and manageable negative impacts to the environment. The expected positive impacts from the three components related to building the capacity of farmers to improve agricultural production and enhance adaptive capacity to climate risks include adoption of sustainable land use and farming practices that will address climate-related events such as floods and droughts, consequently managing soil erosion and degradation. SSITs with climate-resilient design standards and energy-efficiency considerations will include solar powered irrigation to maximize the project's adaptation and mitigation climate co-benefits, as well as enhancing farmers' skills on environmental and social subjects such as how to better understand climate risks and coping power on both adaptation and mitigation perspective as a co-benefit to many of the adaptation options.

63. However, components 1 and 2 which will include delivery of agricultural inputs including quality seeds, agrochemicals, fertilizers (inorganic mainly), efficient farms tools and equipment with minimal civil works activities are associated with negative impacts. There is a possibility these activities will generate construction solid and liquid waste, electronic waste from decommissioned batteries and solar panels from small scale solar irrigation activities, dust, noise pollution and other construction/rehabilitation related Occupational health and safety (OHS) hazards and impact related to handling of treated seeds, increased use of biopesticides and fertilizers, and general waste management from seed companies and agricultural enterprises.

64. These risks and impacts would be site-specific and manageable through proper enforcement of the ESF instruments prepared for the project and using national and international best practice methods. Under the Environmental and Social Commitment Plan (ESCP), the client has committed to prepare Environmental and Social (E&S) instruments in accordance with triggered Environmental and Social Standards (ESSs) applicable to the project activities. These include the Environmental and Social Safeguards Management Framework (ESMF), Stakeholder Engagement Plan (SEP), Environmental and Social Impact Assessment (ESIA)/Environmental and Social Management Plan (ESMP), Labor Management Procedures (LMP), Integrated Pest Management Plan (IPMP), Pest Management Plan (PMP) and other site-specific instruments and Notification of Riparians before commencement of the activities.

65. Operational Policy (OP) 7.50 is applicable to this Project because the Project will finance activities that may use or risk polluting waters of the Akagera and Rusizi rivers and/or their tributaries, which are considered international waterways. However, the exception to the riparian notification requirement according to paragraph 7(a) of the Policy applies project activities will be limited to upgrading and modernization of existing, small-scale schemes, and as such will not adversely change the quantity and quality of water flows to other riparians. The exception to the notification requirement was approved by the Regional Vice President (RVP) for East Africa and Southern Africa on August 8, 2023.

Social Safeguards.

66. The social risk rating of SAIP II is "**Substantial**." The rating is based on the nature of the activities to be implemented under components 1, 2 and 3 of the project, which may impose both positive and manageable negative impacts to the environment. The positive social impacts relate to improving nutrition for the most vulnerable households, improved livelihoods for farmers through increased productivity and food security. Potential social risks are in relation to

ESS2 on Labor and Working Conditions, though anticipated to be of small scale, will include safety and the working conditions of workers on the planned small-scale civil works for renovation, rehabilitation, or establishment of household on-farm agricultural infrastructure (e.g., water harvesting, storage and irrigation systems, food storage facilities), and market infrastructure. The risks are manageable and can be mitigated using Rwanda's labor laws and ESS2 standards. It is also anticipated that risks and impacts related to ESS5 on Land Acquisition, Restrictions on Land Use and Involuntary Resettlement might emerge under component 2, subcomponent 2.1, where new irrigation technologies will be assessed and piloted in some project areas. The associated scale, risks and impacts will be assessed, and mitigation measures will be put in place and reflected in site specific ESMPs, and proportionate Resettlement Action Plans (RAPs).

67. **Stakeholder Engagement**. Based on lessons learnt from SAIP I, the GoR has prepared a SEP for SAIP II to ensure effective stakeholder engagement during project implementation. The SEP includes strengthening stakeholders' engagements through robust information sharing and awareness raising and improving the existing SAIP I Grievance Redress Mechanism (GRM) to ensure that all beneficiaries have access to a GRM including matching grants beneficiaries. Social risks and impacts will be assessed through ESIAs, and mitigation measures integrated into the ESMPs, LMPs, RAPs and Livelihoods Restoration Program (LRP).

68. **Gender Assessment**. The project will continue to work on closing specific gender gaps identified to ensure women will fully benefit from the project interventions. The project will ensure that at least 40 percent of women in the farmers organizations participate in the management of these organizations. To ensure their participation in capacity-building events, the project plans capacity buildings/trainings sessions that at least 40 percent of women and youth can attend, prepare and deliver gender-sensitive training contents and avoid time-consuming sessions, and ensure that activities.

69. **Citizen Engagement (CE)**. Identifying project beneficiaries has been a participatory and transparent process. The project will directly target 75,688 farmer households and 300,000 family members of the targeted households as indirect beneficiaries. CE activities will include: (a) community sensitization and awareness campaigns; (b) community outreach activities; and (c) community dialogues to support formation and strengthening of SHGs especially in the irrigation and post-harvest infrastructure that are newly developed. The project will continue to place strong emphasis on ensuring women and youth participation and leadership in the WUAs, SHGs and cooperatives. The detailed SEP will be used to ensure continuous engagement of all stakeholders throughout implementation. Beneficiary feedback on service delivery will be received annually through an independent survey on community and beneficiary scorecards. The project Results Framework has included specific CE indicators to be monitored, including an indicator to measure beneficiaries' satisfaction in project activities and GRM mechanism. Two indicators were also added to measure women inclusiveness in key project outcomes areas of participation in decision making in farmers organizations, and in accessing the Project grant facility. These indicators will ensure the Project is deliberate in engaging women beneficiaries to ensure their participation and that they are adequately benefitting from project activities.

V. GRIEVANCE REDRESS SERVICES

70. ***Grievance Redress.*** Communities and individuals who believe that they are adversely affected by a project supported by the World Bank may submit complaints to existing project-level grievance mechanisms or the Bank's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the Bank's independent Accountability Mechanism (AM). The AM houses the Inspection Panel, which determines whether harm occurred, or could occur, as a result of Bank non-compliance with its policies and procedures, and the Dispute Resolution Service, which provides communities and borrowers with the opportunity to address complaints through dispute resolution. Complaints may be submitted to the AM at any time after concerns have been brought directly to the

attention of Bank Management and after Management has been given an opportunity to respond. For information on how to submit complaints to the Bank's Grievance Redress Service (GRS), visit http://www.worldbank.org/GRS. For information on how to submit complaints to the Bank's Accountability Mechanism, visit https://accountability.worldbank.org.

VI. KEY RISKS

71. The **overall** risk rating of the project is "**Moderate**" as presented in the Systematic Operational Risk-Rating Tool (SORT) table below:

Table 1: Project Risk Rating

Risk Categories	Rating
Political and Governance	Moderate
Macroeconomic	Substantial
Sector Strategies and Policies	Low
Technical Design of project	Moderate
Institutional Capacity for Implementation and Sustainability	Moderate
Fiduciary	Moderate
Environmental and Social	Substantial
Stakeholders	Low
Other	Low
Overall	**Moderate**

72. The overall risk of the proposed project is considered "**Moderate."** Rwanda's macroeconomic framework has been stable in the past decade. However, the global COVID-19 pandemic, the ongoing Ukraine crisis, general increase in global prices of fertilizers, and climate change related shocks have posed and continue to pose a threat to fiscal sustainability (public debt increased from 20.4 percent in 2010 to 73.6 percent of GDP in 2021). For this reason, the macroeconomic risk is deemed "Substantial." Strong government actions at national level, some of which in conjunction with World Bank support will help mitigate these risks. The GoR has an excellent track of pursuing long-term goals and staying on course, and the World Bank operations (including ongoing and under development policy operations) allow pro-active engagement in the overall macro-fiscal policy dialogue with the authorities and provides opportunities to flag issues as they emerge. The technical design and the institutional capacity risks are "moderate," given the associated sound sector strategy with which the Project is well aligned, and the experienced implementing agency - the RAB SPIU, which is implementing the CDAT and SAIP I projects, for which the proposed project is a natural continuation for the scale-up of interventions and results in new districts.

VII. RESULTS FRAMEWORK AND MONITORING

PDO Indicators by PDO Outcomes

Baseline	Period 1	Period 2	Closing Period
Increase in harvested yield of targeted crops.			
Increase in harvested yield of targeted crops (Percentage)			
Sep/2023	Sep/2024	Sep/2025	Sep/2026
0.00	4.00	7.00	12.50
➢Increase in harvested yield of targeted crops (from SAIP I intervention areas) (Percentage)			
Sep/2023	Sep/2024	Sep/2025	Sep/2026
0.00	3.00	5.00	10.00
➢Increase in harvested yield of targeted crops (from the scaled-up areas) (Percentage)			
Sep/2023	Sep/2024	Sep/2025	Sep/2026
0.00	5.00	10.00	15.00
Increase of produced commodities in targeted value chains marketed by participating producers.			
Increase of produced commodities in targeted value chains marketed by participating producers (Percentage)			
Sep/2023	Sep/2024	Sep/2025	Sep/2026
0.00	5.00	8.00	11.50
➢Increase of produced commodities in targeted value chains marketed by participating producers (from SAIP I intervention areas) (Percentage)			
Sep/2023	Sep/2024	Sep/2025	Sep/2026
0.00	4.00	6.00	8.00
➢Increase of produced commodities in targeted value chains marketed by participating producers (from the scaled-up areas) (Percentage)			
Sep/2023	Sep/2024	Sep/2025	Sep/2026
0.00	6.00	10.00	15.00
Food Consumption Score			
Food Consumption Score (Number)			
Sep/2023	Sep/2024	Sep/2025	Sep/2026
28.00	30.00	32.00	36.00
➢Food Consumption Score (from SAIP I intervention areas) (Number)			

Sep/2023	Sep/2024	Sep/2025	Sep/2026
36.00	37.00	38.00	39.00
➢Food Consumption Score (from the scaled-up areas) (Number)			
Sep/2023	Sep/2024	Sep/2025	Sep/2026
20.00	23.00	26.00	33.00
Farmers adopting improved agricultural technology (Number) CRI			
Sep/2023	Sep/2023	Sep/2025	Sep/2026
45688.00	55000	62000	65688
➢Farmers adopting improved agricultural technology - Female (Number) CRI			
19189.00	23100	26040	27589
➢Farmers adopting improved agricultural technology - male (Number) CRI			
26499.00	31900	35960	38099

Intermediate Indicators by Components

Baseline	Period 1	Period 2	Closing Period
Component 1: Institutional Strengthening, Agriculture Productivity Enhancement, and Nutrition Improvement			
Producer-based organizations supported by GAFSP (GAFSP core 4) GAFSP Tier 2, indicator no. 4 (Number)			
Sep/2023	Sep/2024	Sep/2025	Sep/2026
2,397.00	2,697.00	3,197.00	3,397.00
People receiving improved nutrition services and products (GAFSP core 11) _ GAFSP Tier 2, indicator no. 12 (Number)			
Sep/2023	Sep/2024	Sep/2025	Sep/2026
230,000.00	255,000.00	285,000.00	300,000.00
➢People receiving improved nutrition services and products - Female (Number)			
Sep/2023	Sep/2024	Sep/2025	Sep/2026
96,600	107,100	119,700	126,000
Farmers reached with agricultural assets or services (CRI)_ GAFSP Tier 2, indicator no. 13 (Number)			
Sep/2023	Sep/2024	Sep/2025	Sep/2026
45,688.00	55000	62000	65688
➢Farmers reached with agricultural assets or services - Female (CRI) (Number)			
Sep/2023	Sep/2024	Sep/2025	Sep/2026
19,189	23,100	26,040	27,589
Number of improved institutions supported by the Project (Number)			

Sep/2023	Sep/2024	Sep/2025	Dec/2026
0	500	1,000	1,500
Land area with climate smart agriculture practices implemented (Hectare(Ha))			
Sep/2023	Sep/2024	Sep/2025	Dec/2026
2,500	3,000	4,500	7,000
Increase in annual net revenues made by beneficiary cooperatives. (Percentage)			
Sep/2023	Sep/2024	Sep/2025	Sep/2026
0	8.00	13.00	20.00
➢Increase in annual net revenues made by beneficiary cooperatives (from SAIP I intervention areas) (Percentage)			
Sep/2023	Sep/2024	Sep/2025	Sep/2026
0.00	10.00	15.00	25.00
➢Increase in annual net revenues made by beneficiary cooperatives (from the scaled-up areas) (Percentage)			
Sep/2023	Sep/2024	Sep/2025	Sep/2026
0.00	5.00	10.00	15.00
Matching grants allocated to women led business plans (Percentage)			
Sep/2023	Sep/2024	Sep/2025	Sep/2026
0.00	10.00	20.00	40.00
Component 2: Irrigation and Water Use Efficiency			
Area provided with new/improved irrigation or drainage services (CRI, Hectare) _ GAFSP Tier 2, indicator no. 2 (Hectare(Ha))			
Sep/2023	Sep/2024	Sep/2025	Sep/2026
2,400.00	3,300.00	4,150.00	4,500.00
➢Area provided with new irrigation or drainage services (Hectare(Ha))			
Sep/2023	Sep/2024	Sep/2025	Dec/2026
1,200	1,500	2,000	2,200
➢Area provided with improved irrigation or drainage services (Hectare(Ha))			
Sep/2023	Sep/2024	Sep/2025	Dec/2026
1,200	1,800	2,150	2,300
Farmers benefiting from the project supported small-scale irrigation interventions (Number)			
Sep/2023	Sep/2024	Sep/2025	Sep/2026
2,400.00	2,700.00	1,290.00	3,725.00
➢Farmers benefiting from the project supported small-scale irrigation technologies - Female (Number)			
Sep/2023	Sep/2024	Sep/2025	Dec/2026
1,008.00	1,290.00	1,400.00	1,565.00
Users paying water fees to the water users associations (Number)			

Sep/2023	Sep/2024	Sep/2025	Sep/2026
9,330.00	9,555.00	9,795.00	10,000.00
➢Users paying water fees to the water users associations – Female (Number)			
Sep/2023	Sep/2024	Sep/2025	Sep/2026
3,904.00	4,092.00	4,194.00	4,254.00
Increment of Water Use Efficiency (Percentage)			
Sep/2023	Sep/2024	Sep/2025	Sep/2026
75.00	77.00	79.00	80.00
Increase in women's representation in decision making positions in participating WUAs. (Percentage)			
Sep/2023	Sep/2024	Sep/2025	Sep/2026
0.00	15.00	35.00	50.00
Component 3: Market Linkages and Value Addition Investments Support			
Direct employment generated through project supported investments (Number)			
Sep/2023	Sep/2024	Sep/2024	Dec/2026
0	75	150	250
Number of postharvest facilities constructed with Project support (Number)			
Sep/2023	Sep/2024	Sep/2025	Dec/2026
0	10	20	25
Volume of agricultural production processed by post-harvest facilities established with project support -GAFSP core 9 (Metric ton)			
Sep/2023	Sep/2024	Sep/2025	Sep/2026
23,088.00	27,058.00	31,029.00	35,000.00
Farmers organization - buyer linkages established (Number)			
Sep/2023	Sep/2024	Sep/2025	Sep/2026
52.00	58.00	64.00	70.00
➢Value of contracts/agreements negotiated through linkages established (Amount) (Number)			
Sep/2023	Sep/2024	Sep/2025	Sep/2026
1,970,000.00	2,150,000.00	2,370,000.00	2,500,000.00
Amount of private financing mobilized by beneficiaries (Amount(USD))			
Sep/2023	Sep/2024	Sep/2025	Sep/2026
450,000	1,500,000	2,500,000	3,000,000
➢Amount of credit mobilized by beneficiaries (Amount(USD))			
Sep/2023	Sep/2024	Sep/2025	Sep/2026
450,000	500,000	550,000	600,000
➢Amount of cash contributions mobilized by beneficiaries to match the Project grants (USD) (Amount(USD))			

Sep/2023	Sep/2024	Sep/2025	Sep/2026
0	1,000,000	1,950,000	2,400,000
Component 4: Project Management and Technical Assistance			
Knowledge products produced by the project (Number)			
Sep/2023	Sep/2025		Sep/2026
10.00	20.00		30.00
Beneficiaries satisfied with the services provided by the project (Percentage)			
Sep/2023	Sep/2023	Sep/2023	Sep/2026
80.00	82.00	84.00	85.00

Monitoring & Evaluation Plan: PDO Indicators by PDO Outcomes

Increase in harvested yield of targeted crops.	
Increase in harvested yield of targeted crops (Percentage)	
Description	Weighted average of yield increase across crops in targeted value chains (maize, beans, Irish potatoes, and some of the most cultivated horticulture crops (chili, tomatoes, onions, french beans, tree-tomatoes, and avocado).
Frequency	Annual
Data source	Project agriculture seasonal surveys
Methodology for Data Collection	Randomly selected and representative sample plots in each targeted District
Responsibility for Data Collection	RAB SPIU
Increase in harvested yield of targeted crops (from SAIP I intervention areas) (Percentage)	
Description	Weighted average of yield increase across crops in targeted value chains (maize, beans, Irish potatoes, and some of the most cultivated horticulture crops (chili, tomatoes, onions, french beans, tree-tomatoes, and avocado).
Frequency	Annual
Data source	Project agriculture seasonal surveys
Methodology for Data Collection	Randomly selected and representative sample plots in each targeted District (9 Districts)
Responsibility for Data Collection	RAB SPIU
Increase in harvested yield of targeted crops (from the scaled-up areas) (Percentage)	
Description	Weighted average of yield increase across crops in targeted value chains (maize, beans, Irish potatoes, and some of the most cultivated horticulture crops (chili, tomatoes, onions, french beans, tree-tomatoes, and avocado).
Frequency	Annual
Data source	Project agriculture seasonal surveys
Methodology for Data Collection	Randomly selected and representative sample plots in each targeted District (11 Districts)
Responsibility for Data Collection	RAB SPIU
Increase of produced commodities in targeted value chains marketed by participating producers.	
Increase of produced commodities in targeted value chains marketed by participating producers (Percentage)	
Description	Weighted average of the increase of the marketed portion of produce across crops in targeted value chains (maize, beans, Irish potatoes, and some of the most cultivated horticulture crops (chili, tomatoes, onions, french beans, tree-tomatoes, and avocado).
Frequency	Annual
Data source	Project agriculture seasonal surveys
Methodology for Data Collection	Data from randomly selected and representative sample plots in each targeted District
Responsibility for Data Collection	RAB SPIU
Increase of produced commodities in targeted value chains marketed by participating producers (from SAIP I intervention areas) (Percentage)	
Description	Weighted average of the increase of the marketed portion of produce across crops in targeted value chains (maize, beans, Irish potatoes, and some of the most cultivated horticulture crops (chili, tomatoes, onions, french beans, tree-tomatoes, and avocado).
Frequency	Annual
Data source	Project agriculture seasonal surveys
Methodology for Data Collection	Data from randomly selected and representative sample plots in each targeted District (9 Districts)
Responsibility for Data	RAB SPIU

Collection	
Increase of produced commodities in targeted value chains marketed by participating producers (from the scaled-up areas) (Percentage)	
Description	Weighted average of the increase of the marketed portion of produce across crops in targeted value chains (maize, beans, Irish potatoes, and some of the most cultivated horticulture crops (chili, tomatoes, onions, french beans, tree-tomatoes, and avocado).
Frequency	Annual
Data source	Project agriculture seasonal surveys
Methodology for Data Collection	Data from randomly selected and representative sample plots in each targeted District (11 Dsitricts)
Responsibility for Data Collection	RAB SPIU
Food Consumption Score	
Food Consumption Score (Number)	
Description	FCS score in intervention areas
Frequency	Annual
Data source	Survey report
Methodology for Data Collection	Household survey
Responsibility for Data Collection	RAB SPIU
Food Consumption Score (from SAIP I intervention areas) (Number)	
Description	FCS score in the SAIP I intervention areas.
Frequency	Annual
Data source	Survey report
Methodology for Data Collection	Household survey
Responsibility for Data Collection	RAB SPIU
Food Consumption Score (from the scaled-up areas) (Number)	
Description	FCS in the scale-up areas by SAIP II
Frequency	Annual
Data source	Survey report
Methodology for Data Collection	Household survey
Responsibility for Data Collection	RAB SPIU
Farmers adopting improved agricultural technology (Number) [CRI]	
Description	Adoption of improved agriculture technologies is defined as adoption of at least two of the following: soil fertility management, use of (not-re-used) seeds, IPM, conservation tillage, contour bunding, crop rotation, agroforestry practices, and irrigation water saving technologies.
Frequency	Annual
Data source	Survey report
Methodology for Data Collection	Household survey
Responsibility for Data Collection	RAB SPIU
Farmers adopting improved agricultural technology - Female (Number) [CRI]	
Description	Adoption of improved agriculture technologies is defined as adoption of at least two of the following: soil fertility management, use of (not-re-used) seeds, IPM, conservation tillage, contour bunding, crop rotation, agroforestry practices, and irrigation water saving technologies (female beneficiaries).

Frequency	Annual
Data source	Survey report
Methodology for Data Collection	Household survey
Responsibility for Data Collection	RAB SPIU
Farmers adopting improved agricultural technology - male (Number) [CRI]	
Description	Adoption of improved agriculture technologies is defined as adoption of at least two of the following: soil fertility management, use of (not-re-used) seeds, IPM, conservation tillage, contour bunding, crop rotation, agroforestry practices, and irrigation water saving technologies (male beneficiaries).
Frequency	Annual
Data source	Survey report
Methodology for Data Collection	Household survey
Responsibility for Data Collection	RAB SPIU

Monitoring & Evaluation Plan: Intermediate Results Indicators by Components

Component 1: Institutional Strengthening, Agriculture Productivity Enhancement, and Nutrition Improvement	
Producer-based organizations supported by GAFSP (GAFSP core 4) GAFSP Tier 2, indicator no. 4 (Number)	
Description	Number of cooperatives, SHGs and WUAs benefiting from Project interventions
Frequency	Annual
Data source	Project monitoring reports
Methodology for Data Collection	Administrative data
Responsibility for Data Collection	RAB SPIU
People receiving improved nutrition services and products (GAFSP core 11) _ GAFSP Tier 2, indicator no. 12 (Number)	
Description	Project beneficiaries receiving nutrition services, including both mobilization for increased consumption of nutritious foods, and interventions to faciliate access to plant based nutritious foods and animal protein based foods.
Frequency	Annual
Data source	Project monitoring reports
Methodology for Data Collection	Administrative data
Responsibility for Data Collection	RAB SPIU
People receiving improved nutrition services and products - Female (Number)	
Description	Project beneficiaries receiving nutrition services, including both mobilization for increased consumption of nutritious foods, and interventions to faciliate access to plant based nutritious foods and animal protein based foods (women)
Frequency	Annual
Data source	Project monitoring reports
Methodology for Data Collection	Administrative data
Responsibility for Data Collection	RAB SPIU
Farmers reached with agricultural assets or services (CRI)_ GAFSP Tier 2, indicator no. 13 (Number)	
Description	Household beneficiaries reached with extension services, faciliated to access irrigation equipment, production and postharvest assets through the matching grant facility.
Frequency	Annual

Data source	Project monitoring reports
Methodology for Data Collection	Administrative data
Responsibility for Data Collection	RAB SPIU
Farmers reached with agricultural assets or services - Female (CRI) (Number)	
Description	Household beneficiaries reached with extension services, faciliated to access irrigation equipment, production and postharvest assets through the matching grant facility (women).
Frequency	Annual
Data source	Project monitoring reports
Methodology for Data Collection	Administrative data
Responsibility for Data Collection	RAB SPIU
Number of improved institutions supported by the Project (Number)	
Description	Number of SHG, cooperatives and WUA supported by the Project which have improved their organizational capacity
Frequency	Annual
Data source	Project monitoring reports
Methodology for Data Collection	Administrative data
Responsibility for Data Collection	RAB SPIU
Land area with climate smart agriculture practies implemented	
Description	Land with adoption of at least two of the following practices: use of climate resilient seeds, IPM, conservation tillage, contour bunding, crop rotation, agroforestry practices, and irrigation.
Frequency	Annual
Data source	Project monitoring reports
Methodology for Data Collection	Administrative data
Responsibility for Data Collection	RAB SPIU
Increase in annual net revenues made by beneficiary cooperatives. (Percentage)	
Description	Weighted average of the increase of net revenues made by cooperatives supported by the Project
Frequency	Annual
Data source	Project monitoring reports
Methodology for Data Collection	Administrative data
Responsibility for Data Collection	RAB SPIU
Increase in annual net revenues made by beneficiary cooperatives (from SAIP I intervention areas) (Percentage)	
Description	Weighted average of the increase of net revenues made by cooperatives supported by the Project
Frequency	Annual
Data source	Project monitoring reports(9 Districts)
Methodology for Data Collection	Administrative data
Responsibility for Data Collection	RAB SPIU
Increase in annual net revenues made by beneficiary cooperatives (from the scaled-up areas) (Percentage)	
Description	Weighted average of the increase of net revenues made by cooperatives supported by the Project
Frequency	Annual

Data source	Project monitoring reports(11 Dsitricts)
Methodology for Data Collection	Administrative data
Responsibility for Data Collection	RAB SPIU
Matching grants allocated to women led business plans (Percentage)	
Description	Proportion of women led business plans among all business plans supported by the Project with matching grants.
Frequency	Annual
Data source	Project monitoring reports
Methodology for Data Collection	Administrative data
Responsibility for Data Collection	RAB SPIU
Component 2: Irrigation and Water Use Efficiency	
Area provided with new/improved irrigation or drainage services (CRI, Hectare) _ GAFSP Tier 2, indicator no. 2 (Hectare(Ha))	
Description	This indicator measures the total area of land provided with irrigation and drainage services under the project, including in (i) the area provided with new irrigation and drainage services, and (ii) the area provided with improved irrigation and drainage services, expressed in hectare (ha).
Frequency	Annual
Data source	Project monitoring reports
Methodology for Data Collection	Administrative data
Responsibility for Data Collection	RAB SPIU
Area provided with new irrigation or drainage services (Hectare(Ha)) CRI	
Description	This indicator measures in hectares the total area of land provided with new irrigation and drainage services under the project
Frequency	Annual
Data source	Project monitoring reports
Methodology for Data Collection	Administrative data
Responsibility for Data Collection	RAB SPIU
Area provided with improved irrigation or drainage services (Hectare(Ha)) CRI	
Description	Measures in hectares the total area of land provided with improved irrigation or drainage services in operations supported by the World Bank (water use efficient technologies promoted by the Project).
Frequency	Annual
Data source	Project monitoring reports
Methodology for Data Collection	Administrative data
Responsibility for Data Collection	RAB SPIU
Farmers benefiting from the project supported small-scale irrigation interventions (Number)	
Description	Measures the number of beneficiaires acquiring and installing equipment for small-scale irrigation technologies
Frequency	Annual
Data source	Project monitoring reports(11 Dsitricts)
Methodology for Data Collection	Administrative data
Responsibility for Data Collection	RAB SPIU

Farmers benefiting from the project supported small-scale irrigation technologies - Female (Number)	
Description	Measures the number of beneficiaires acquiring and installing equipment for small-scale irrigation technologies
Frequency	Annual
Data source	Project monitoring reports
Methodology for Data Collection	Administrative data
Responsibility for Data Collection	RAB SPIU
Users paying water fees to the water users associations (Number)	
Description	Number of farmers paying water fees to their WUAs
Frequency	Annual
Data source	Project monitoring reports
Methodology for Data Collection	Administrative data
Responsibility for Data Collection	RAB SPIU
Users paying water fees to the water users associations – Female (Number)	
Description	Number of farmers paying water fees to their WUAs(women)
Frequency	Annual
Data source	Project monitoring reports
Methodology for Data Collection	Administrative data
Responsibility for Data Collection	RAB SPIU
Increment of Water Use Efficiency (Percentage)	
Description	Increase in area covered by water use efficient technologies
Frequency	Annual
Data source	Project monitoring reports
Methodology for Data Collection	Administrative data
Responsibility for Data Collection	RAB SPIU
Increase in women's representation in decision making positions in participating WUAs. (Percentage)	
Description	The indicator measures women participation in executive committees and other elected committees in WUAs. This indicator is in response to the identified constraint to women's access to irrigation services.
Frequency	Annual
Data source	Project monitoring reports
Methodology for Data Collection	Administrative data
Responsibility for Data Collection	RAB SPIU
Component 3: Market Linkages and Value Addition Investments Support	
Direct employment generated through projects supported investments (Number)	
Description	Number of employment positions created as a result of projects supported by the Project through its grants program
Frequency	Annual
Data source	Project monitoring reports
Methodology for Data Collection	Administrative data
Responsibility for Data Collection	RAB SPIU

Number of postharvest facilities cnstructed with Project support	
Description	Number of processing, storage, collection center, and/or market facilities constructed
Frequency	Annual
Data source	Project monitoring reports
Methodology for Data Collection	Administrative data
Responsibility for Data Collection	RAB SPIU
Volume of agricultural production processed by post-harvest facilities established with project support -GAFSP core 9 (Metric ton)	
Description	Volume in metric tons the agricultural production aggregated in collection or storage facilities, or processed in processing factories established with Project support
Frequency	Annual
Data source	Project monitoring reports
Methodology for Data Collection	Administrative data
Responsibility for Data Collection	RAB SPIU
Farmers organization - buyer linkages established (Number)	
Description	Number of linkages between beneficiary producers and off-takers/buyers/processors of agricultural produce
Frequency	Annual
Data source	Project monitoring reports
Methodology for Data Collection	Administrative data
Responsibility for Data Collection	RAB SPIU
Value of contracts/agreements negotiated through linkages established (Amount) (Number)	
Description	Value of sales through contracts negotiated through linkages between beneficiary producers and off-takers/buyers/processors of agricultural produce
Frequency	Annual
Data source	Project monitoring reports
Methodology for Data Collection	Administrative data
Responsibility for Data Collection	RAB SPIU
Amount of private financing mobilized by beneficiaries (Amount(USD))	
Description	Amount of credit mobilized by farmers and their organizations from formal financial institutions, or cash contributions mobilized by farmers to access the Project's grant program
Frequency	Annual
Data source	Project monitoring reports
Methodology for Data Collection	Administrative data
Responsibility for Data Collection	RAB SPIU
Amount of credit mobilized by farmers and farmers organization (Amount) (Amount(USD))	
Description	Amount of credit mobilized by farmers and their organizations from formal financial institutions
Frequency	Annual
Data source	Project monitoring reports
Methodology for Data Collection	Administrative data
Responsibility for Data	RAB SPIU

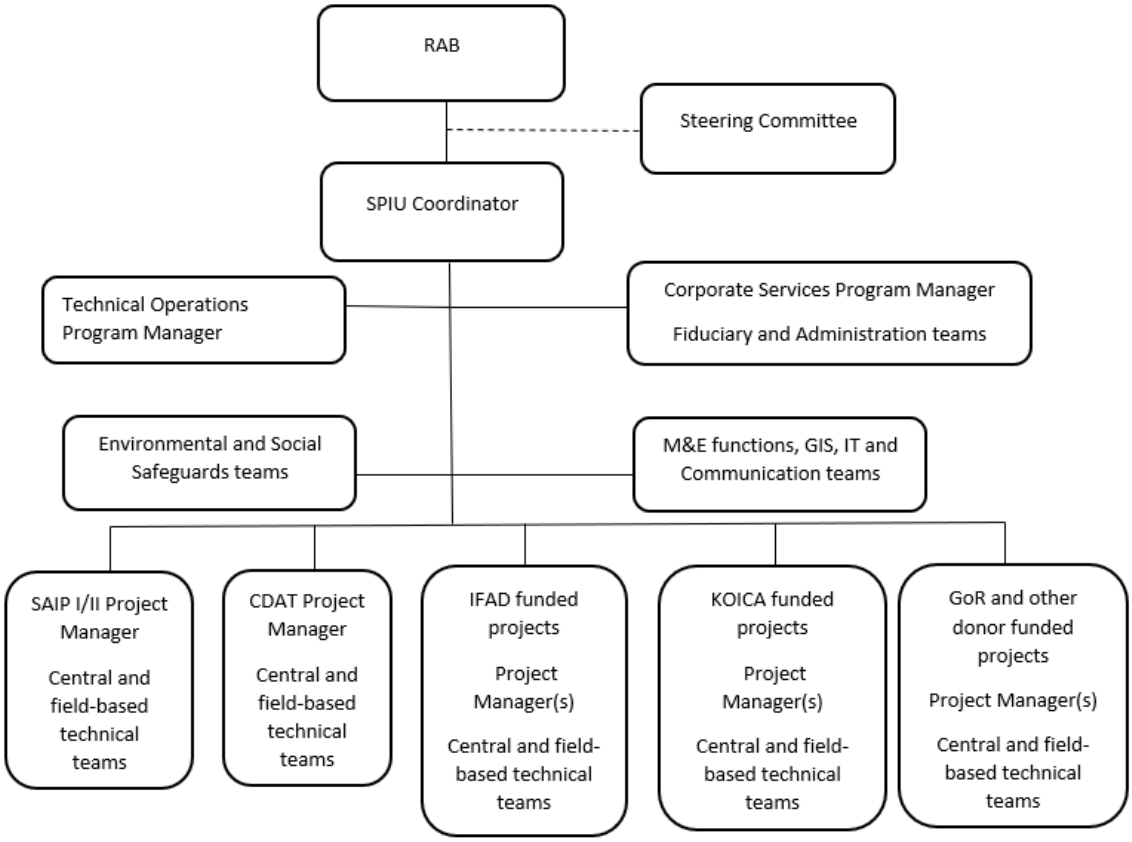
Collection	
Amount of cash contributions mobilized by beneficiaries to match the Project grants (USD)	
Description	Amount of cash contributions mobilized by farmers to access the Project's grant program
Frequency	Annual
Data source	Project monitoring reports
Methodology for Data Collection	Administrative data
Responsibility for Data Collection	RAB SPIU
Component 4: Project Management and Technical Assistance	
Knowledge products produced by the project (Number)	
Description	Number of knowledge products produced by the Project, including capacity building manuals, video content produced to provide extension services, dissemination document materials on lessons learned from project implementation, mobilization document or video content materials for technologies promoted by the Project, etc.
Frequency	Annual
Data source	Project monitoring reports
Methodology for Data Collection	Administrative data
Responsibility for Data Collection	RAB SPIU
Beneficiaries satisfied with the services provided by the project (Percentage)	
Description	Proportion of beneficiaries satisfied with the Project interventions including GRM mechanisms.
Frequency	Annual
Data source	Project survey reports
Methodology for Data Collection	Household survey
Responsibility for Data Collection	RAB SPIU

ANNEX 1: Implementation Arrangements and Support Plan

COUNTRY: Republic of Rwanda
SUSTAINABLE AGRICULTURAL INTENSIFICATION AND FOOD SECURITY PROJECT II

1. **The Rwanda Agriculture and Animal Resources Development Board (RAB) will ensure the overall coordination of the project, through its current Single Projects Implementation Unit (SPIU)**. The SPIU will be responsible for day-to-day project management and implementation, including FM, procurement, and monitoring. The SPIU will have a coordinator, a Technical Operations Program Manager, a Financial Program Manager, a fiduciary, safeguards, technical (including a specific Project Manager for each project in the SPIU), and M&E teams to coordinate the implementation of different components of the project.

Figure 1: Project implementation arrangements



2. The different projects in the SPIU will be feeding into five (5) programs led by Lead Specialists, namely: (i) Land Husbandry, Irrigation & Mechanization; (ii) Agriculture, Horticulture & Commodity Chain Development; (iii) Animal Resources Development; (iv) Research and Innovation; and (v) Value chain development, Access to Finance and Agricultural Insurance. While each project may not cover all the 5 programs, the organization of the SPIU along these programs will facilitate an efficient coordination of how each project contributes to different sectoral objectives.

3. RAB SPIU has long-term experience in managing World Bank funded projects, including the Rural Sector Support Project (RSSP), the Land Husbandry Water Harvesting and Hillside Irrigation Project (LWH), the first SAIP, and the Commercialization and De-risking for Agricultural Transformation Project (CDAT). The same SPIU also coordinates International Fund for Agriculture Development (IFAD), Korea International Cooperation Agency (KOICA) and other donor funded projects, in addition to Government funded projects.

4. **A Steering Committee (SC) will be established to provide strategic guidance during project implementation**. The Committee, chaired by the Permanent Secretary of MINAGRI, will be composed of multiple stakeholders, including various ministries and other relevant agencies, representatives of farmers organization and civil society organizations. The Steering Committee will have the following key responsibilities:

a. Review and approval of action plans.
b. Review and approval of financial plans.
c. Review and approval of project implementation reports.
d. Provide strategic guidance on addressing any challenges or bottlenecks in the Project implementation.

Financial Management arrangements

5. **A Financial Management (FM) assessment has been carried out for the project in accordance with the World Bank policy and directives on Investment Project Financing (IPF).** The assessment was carried out at RAB as the main implementing entity which will ensure: (a) that funds are used for the intended purposes in an effective, efficient, and economical way; (b) financial reports will be prepared in a reliable, accurate and timely manner; and (c) project assets will be appropriately safeguarded**.**

Country PFM

6. **Rwanda's public financial management (PFM) system is anchored in solid legal frameworks including**: the 2003 Rwanda Constitution, revised on December 24, 2015, Articles 162 to 166; the Organic Law[28] N° 12/2013 of 12/09/2013 on State Finances and Property that establishes principles and modalities for sound management of State finances and property; the Ministerial Order[29] N°001/16/10/TC dated 26/01/2016 on financial regulations that regulates the structure and functioning of public FM, the preparation and implementation of the state budget, the accounting and reporting of all financial transactions, and financial control; government Accounting Policies Manual and Articles 165-166 of the Rwanda revised Constitution and the Law N° 79/2013 of 11/9/2013 which determines the mission, organization and functioning of the Office of the Auditor General of State finances.

7. **The public financial management system had gone through a series of reforms since 2008**, guided by the PFM strategy plan 2008–2012, the PFM SSP 2013–2018 and the 2018–2023 PFM strategy. At the national level, progress has been made in budget planning, expenditure efficiency, enhancement of the internal audit function,

[28] The organic law applies to all budget entities at the central and decentralized levels and sets up fundamental public finance management principles as comprehensiveness, transparency, accountability, uniformity, consolidation, and gender balance in public State finance management.
[29] The Order applies to the management of public finances of all public entities, including of the central government, decentralized entities, public institutions, and subsidiary entities.

external audit coverage, and financial reporting. The Public Expenditure and Financial Accountability (PEFA) 2022 confirmed these strengths. Nevertheless, areas for improvement include the weak consultative approach to budget preparation, access to fiscal information, lack of critical mass of qualified PFM staff and low alignment of budget with policies. The project's arrangements will rely on the existing PFM system at central and decentralized levels, and on the individual FM Systems in each of the implementing agencies with some amendments to consider the project's and the World Bank's FM requirements. The detailed modalities will be presented in the PIM.

FM Arrangements of the Project

8. **Planning and budgeting.** The RAB SPIU for World Bank and KOICA funded Projects will be responsible for coordinating the budget and compiling one Annual Work Plan and Budget (AWPB) for the project on annual basis. The SPIU shall follow the government's planning and budgeting procedures including its approval by the parliament every year. The project budgets shall also be presented to the project Steering Committee for approval. The approved budgets will be monitored on a monthly and quarterly basis by the preparation and analysis of budget execution reports including: (a) budget for the period and for the year; (b) actual expenditure for the period and to date; (c) future expenditure commitments; and (d) balance of period budget remaining (actual expenditure and commitments together compared to period budget). The annual workplan and budget shall be submitted to the World Bank for no-objection.

9. **Accounting and staffing.** The project financial records shall be maintained at the SPIU using the government Integrated Financial Management Information and System, which shall be modified to accommodate any special financial reporting requirements for the project to enable clear reporting for all the components. The RAB SPIU is adequately staffed currently with Head of Finance and Administration; chief accountant and 2 Financial management specialists[30] (FMSs). All project staff will require capacity building on managing Bank financed operations which will be provided at project launch and regularly thereafter.

10. **Internal control and internal audit.** The implementing entity is governed by the legal frameworks and manuals prescribed above. The project will continue to use the PIM and FM manual prepared under SAIP I. Currently there is a Matching Grant Manual with all guidelines (eligibility criteria, Preparation and approval of Business Plans and Matching Grant agreements, implementation of approved Business plans, procurement, ineligible expenditure, conflict of interest) which is under use. These manuals will continue to be in use with any updates incorporated for the needs of SAIP II. The FM manual reflects detailed internal control arrangements for the project, including the extent of segregation of functions in payment processing and internal check mechanisms, in addition to payment approval and authorization arrangements. To enhance internal control arrangements for the project, internal audit reviews will be conducted by the RAB SPIU internal auditor at least on annual basis over project activities and submit reports to the project management team and to the World Bank during implementation support missions.

11. **Financial reporting.** Experience from the implementation of SAIP I has shown that quarterly IFRs were submitted on time with acceptable quality. The SPIU will submit one consolidated quarterly IFR to the World Bank within 45 days after the end of the quarter end. The interim financial reports will be used to monitor project

[30] One fully dedicated to SAIP and another to CDAT which is also a World-bank funded Project.

financial progress, including the rate of budget execution and level of disbursements. RAB will also prepare annual project financial statements, which will be submitted for external audit within 45 days after the end of the financial year. Financial reports shall at a minimum include consolidated sources and uses of funds (revenues and expenditures statement); consolidated financial position statement; consolidated cash flow statement; consolidated budget execution report; designated Account activity statement; Notes on accounting policies and appendices.

12. **External audit.** The project activities will be subject to external audit by the Office of the Auditor General. The audit reports and management letters will be submitted to the World Bank within six months after the end of the financial year. The audit reports will be publicly disclosed in accordance with the World Bank Access to Information Policy. Upon receipt of the audit reports, the RAB will be expected to prepare an action plan to address the audit findings. Follow up on the implementation of audit recommendations will be conducted as part of regular World Bank FM supervision missions and quarterly review of Interim audited financial Reports. Experience from SAIP I indicates that the audit committee meets every quarter and reviews status of audit findings.

13. **Funds flow arrangements.** The project will maintain one segregated Designated Account at the RAB which shall be maintained at the National Bank of Rwanda and shall be denominated in US dollars. For the technical support to be provided by FAO, UN advance will be opened as was the case under SAIP I. Disbursements will follow the Report-based disbursement method. However, the project may also use direct payments, advances to the Designated Account, reimbursement and special commitments depending on the case. Upon effectiveness, the project will submit to the World Bank a request for withdrawal of funds based on two quarters forecast as will be reflected on the Disbursement and Financial Information Letter (DFIL). Based on the request, the World Bank will transfer the proceeds of the trust fund to the Designated Account. Subsequent replenishment of the Designated Accounts will be based on the submission of application of withdrawal accompanied by the quarterly IFRs which are cleared by the Bank. The detailed fund flow modalities will be presented in the PIM and the DFIL.

FM risk and Action Plan

14. **The FM risk of the project is rated Moderate.** The key risks identified are: (a) double dipping of expenditure due to the overlap period between SAIP I and II as the project implements similar activities in projects; and (ii) inadequate and delayed implementation of external and internal audit recommendations.

15. **Mitigating measures have been incorporated in the project.** These are: (a) the SPIU will update the current FM guidelines to incorporate the new districts and activities of the project; (b) the project will continue to use the existing manual with updates and modifications as needed for SAIP II; (c) the SAIP II will finance new interventions and activities in the 9 districts of SAIP I interventions only after SAIP I is closed so as to avoid double count of expenditure; and (d) the World Bank will support and provide training on World Bank FM and disbursement procedures to project FM staff before effectiveness and as needed during project implementation.

Table 1: FM Risks and Mitigation Measures

Risk	Risk Mitigating Measures Incorporated into Project Design	Residual Risk Rating
Inherent risk		Substantial
Country level The country's political environment is deemed stable with ongoing judicial and legislative reforms. Governance challenges include retaining adequate accounting and internal audit capacity across government, and weak linkage between budgeted and actual performance.	Establishment of Medium-Term Expenditure Framework as a basis for government budgeting, adoption of International Public Sector Accounting Standards, implementation of smart Integrated Financial Management Information System. Regular oversight through the Office of the Auditor General, which is deemed independent and effective. Ongoing Bank support on public financial management and accountability.	Moderate
Entity level RAB has experience in implementing various bank financed operations and performance has been satisfactory. 11 new districts have been introduced in the project	The World Bank to provide support and training on World Bank FM and disbursement procedures to all project staff before effectiveness and as needed during project implementation.	Moderate
Project level There may be challenges executing, monitoring, and coordinating the various project activities. Activities such as matching grants require clear guidelines	The existing PIM/FM Manual will be updated with the introduction of new activities and districts. Manuals for matching grants will clearly lay out the eligibility criteria, fund flow and accountability arrangements. Dedicated accountants will be placed at the SPIU	Moderate
Control Risk		Moderate
Budgeting Unreliable budget forecast	The RAB to strictly follow national budget procedures and timelines. Engage all project stakeholders effectively early during the planning and budgeting process (Steering Committee, districts, and the World Bank). Ensure that annual work plans and budgets are in line with the procurement plan to prevent any delays.	Substantial
Accounting Existing accounting capacity at each of the implementing agencies needs to be enhanced through the recruitment of additional FM staff.	Existing staff at SPIU will continue for SAIP II.	Moderate

Internal controls and internal audit Due to overlap period of SAIP I and II, there is a risk of double dipping/counting of risk The project may not get adequate internal audit coverage	Use the existing PIM and FM manual for SAIP II SAIP II implementation to be focused on new activities and new districts until SAIP I is closed. RAB internal audit functions must include the project activities as part of their annual work plans and produce a report at least once a year.	Substantial
Funds flow Potential funds flow delays may affect delivery of critical project activities.	Open Designated Accounts denominated in US dollars in National Bank of Rwanda for SAIP II. Funds disbursed by the World Bank on six-month cash flow forecast which will be detailed out on the DFIL.	Moderate
Financial reporting and monitoring Unreliable interim financial report (IFRs) and delay in submitting the IFRs.	RAB to enroll the project activities into the Integrated Financial Management Information System and produce reports from thereon. Monthly management reviews of FM reports should mitigate unreliability of IFRs and templates for reporting will be agreed during project negotiation	Moderate
External auditing Delay in submitting the audit report.	The Auditor General should be engaged on time to ensure the audit reviews start early so that reports are delivered on time.	Moderate
Fraud and corruption Risk of fraud and corruption.	Any instances of suspected fraud are reported to the Rwanda Investigation Bureau (RIB) for proper investigation and prosecution. These could be reported by the Internal Auditor, a whistle blower or any staff of the organization. There is a RIB hotline for reporting any suspicions of fraud. There is no public record of court decisions. The Auditor General's reports and presented to the Public Accounts committee of the Parliament. Any cases of Fraud are taken up by the Ministry of Justice for prosecution.	Moderate
Overall Risk		Moderate

16. Based on the risk assessment, on site semi-annual FM implementation support and supervision missions will be carried out. During these visits, follow up will be made on internal and external audit reports and action taken thereon; transaction reviews and overall assessment of the adequacy of the FM Systems will be carried out. Desk reviews of quarterly IFRs and annual audit reports will be conducted. Capacity building initiatives will be carried out at project effectiveness and regularly thereon.

Procurement arrangements

17. Procurement for the proposed project will be conducted in accordance with the 'World Bank Procurement Regulations for Borrowers under Investment Project Financing,' dated November 2020, hereafter referred to as 'Procurement Regulations'. The project will be subject to the World Bank's Anticorruption Guidelines, dated July

1, 2016, and beneficiary disclosure requirements. The proposed project will use Systematic Tracking of Exchanges in Procurement (STEP), a planning and tracking system that will provide data on procurement activities, establish benchmarks, monitor delays, and measure procurement performance.

18. **A Project Procurement Strategy for Development (PPSD)** has been prepared by the client. It reviews the market, procurement risks, procurement options and sets out the selection methods to be followed in the procurement of goods, works, and non-consulting and consulting services financed by the project. The PPSD includes a Procurement Plan for the first 18 months which will be updated at least annually or as required to reflect the actual project implementation needs and improvements in institutional capacity.

Box 1. Summary of the PPSD

The Project allocation is US$20 million; This PPSD only addresses the non-financial intermediary part which will be implemented following World Bank procurement regulation.

The project procurement profile comprises of Rehabilitation of Irrigation Schemes, Post-Harvest Infrastructures, New Irrigation Technology, Supply & Installation of Small-Scale Irrigation Technologies, Agriculture Inputs, Technical Assistance and Environmental Impact Assessment.

The assessment revealed that RAB-SPIU has extensive experience in implementing similar projects and is staffed with three (3) well experienced and qualified procurement specialists.

Competitive bidding, transparent and fair public procurement systems give satisfaction to suppliers and contractors and encourage them to participate in procurement opportunities. The analysis indicates there is no high risk of market, both in terms of competitiveness of the market and quality of the services. As a result, market soundness of the project is assessed to be adequate. The PPSD identified internal and external risks: (i) Gap in domestic production of construction materials and irrigation equipment relative to the demand generated by Rwanda's construction sector can delay the completion of works and award contract on high cost; Mitigation measure are: Indicate the estimated quantities of materials that will be needed so that the successful bidders make order of materials/equipment at once rather than making frequent purchases, Starting early procurement process to enable contractors' ample time to know where to get the required construction materials and equipment, these will allow them sufficient time for preparing bids, Using international competitive procurement and encouraging contractors to employ local labor with necessary job skills will ultimately reduce reliance on expensive foreign experts. It is also important to note that, in Rwanda, most irrigation equipment is exempted from Value Added Tax. (ii) Environmental risk: the risk associated with the external forces from the surroundings or environment, these are uncontrollable events (Example: Floods); mitigation measure is: Promotion of high technology in land protection and work hard in dry season rather than rain season. (iii) Financial risk: bankrupt and currency exposure: mitigation: Deep analysis of bidders and risk transfer (insuring against risk). Since the project will continue to finance investments and agricultural inputs to support improved productivity; procurement activities are considered as low risk and there will be no high-risk contracts that will require a high level of analysis.

The PPSD identified the most appropriate approach and methods for the project. An open competitive approach to market is preferred as it provides all eligible prospective Bidders/Proposers an equal opportunity to bid. After analysis of various options for the procurement approach and contracting strategy, international market approach using QCBS, and ICB would be the most appropriate selection arrangement for procurement of the identified consultancy services, Goods and works because the participation of foreign firms will increase competition and may assure the achievement of best VfM. The National Market approach using NCB and RFQ will be used depending on value and risk of the specific procurement activities. Mainly International and national market approach for Works, Goods and non-consultancy services and consultancy services are recommended, whereas other methods will be used as may be found appropriate in rate cases.

Duly considering the procurement profile and contract management arrangements, based on the perceived risks and proposed mitigation measures, the project's overall procurement risk rating is determined as '**Moderate**.' The risk rating on procurement will be reviewed and updated periodically by the World Bank.

19. **STEP:** The project will use Systematic Tracking of Exchanges in Procurement (STEP), a planning and tracking system, which will provide data on procurement activities, establish benchmarks, monitor delays, and measure procurement performance.

20. **E-Procurement system***:* Implementing agencies of the project will be using the Rwanda e-Procurement system (Umucyo) for "post" procurement activities, in parallel with Bank STEP system.

21. **Beneficial Ownership:** Beneficial Ownership Disclosure is now required for all new procurement advertised or invited on or after July 1st, 2022, subject to open or limited international competition under all IPF projects, which are governed by the Procurement Regulations, and hence will apply to the project accordingly.

22. **Procurement risk assessment.** A procurement capacity and risk assessment has been carried out by the World Bank for RAB to review the organizational structure and functions, experience, staff skills and capacity, procurement cycle management, quality, and adequacy of supporting and control systems and record keeping. Based on the assessment the following risks are identified: (i) Gap in domestic production of construction materials and irrigation equipment relative to the demand generated by Rwanda's construction sector can delay the completion of works and award contract on high cost; (ii) Environmental risk: the risk associated with the external forces from the surroundings or environment, these are uncontrollable events (Example: Floods); (iii)Financial risk: bankrupt and currency exposure.

23. **The proposed mitigation measures for the identified risks are**: (a) Indicate the estimated quantities of materials that will be needed so that the successful bidders make order of materials/equipment at once rather than making frequent purchases, Starting early procurement process to enable contractors' ample time to know where to get the required construction materials and equipment, these will allow them sufficient time for preparing bids, Using international competitive procurement and encouraging contractors to employ local labor with necessary job skills will ultimately reduce reliance on expensive foreign experts. It is also important to note that, in Rwanda, most irrigation equipment is exempted from Value Added Tax; (b) Promotion of high technology in land

protection and work hard in dry season rather than rain season; (c) Deep analysis of bidders and risk transfer (insuring against risk). Since project will continue to finance investments and agricultural inputs to support improved productivity; procurement activities are considered as low risk and there will be no high-risk contracts that will require a high level of analysis.

24. **Project Procurement Risk Rate:** Based on a procurement assessment of the implementing agencies, market practice and nature of anticipated procurement activities of the project, the project procurement risk is rated "**Moderate"**.

25. **RAB-SPIU** is well-established and is staffed by a SPIU Coordinator, three (3) procurement staffs, Public Tender Committee (PTC) composed of seven (7) members, a finance team, and other technical staffs. The procurement staff have the required qualifications and experience to manage project procurement. RAB-SPIU has acquired extensive experience in procurement and contract management of various sizes and similar projects financed by development partners including the World Bank.

26. The project procurement profile comprises of Rehabilitation of Irrigation Schemes, Post-Harvest Infrastructures, New Irrigation Technology, Supply & Installation of Small-Scale Irrigation Technologies, Agriculture Inputs, Technical Assistance and Environmental Impact Assessment. No high value or high risk or complex procurement activity involved under the project.

27. Starting 1st July 2017, the Government of Rwanda developed and rolled out E-Procurement (UMUCYO) and made it mandatory for procuring entities in the country starting from 1st July 2017. As of 1st January 2019, the system is used for World Bank financed "Post Review" procurements, in parallel with the STEP.

28. Suppliers of goods, works and services are available in the country. In case of market limitation for specialized items, alternative measures will be recommended by the PPSD, regarding market approach and selection methods.

29. There is an adequate procurement oversight mechanism in place within all the five implementing agencies. The agencies have a strong internal audit structure, in addition to external procurement audit by Office of Auditor General (OAG) which conducts annual procurement and finance audits of all implementing agencies. In addition, Rwanda has a robust complaint review and resolution mechanism. The procurement law provides for a National Independent Review Panel (NIRP) independent of government, which deals with complaints received from bidders and consulting firms or individuals. The E-Procurement system includes a feature for submitting and addressing complaints electronically in the system and hence all complaints and responses are available in the system for public disclosure and auditing.

30. The assessment concluded that in general, RAB-SPIU's track record of procurement performance is satisfactory. The existing three (3) procurement specialists are adequate to manage procurement of the project in addition to their current work at hand.

31. A preliminary Procurement Plan with a list of procurable items with corresponding cost estimates, review types and selection methods is included in the PPSD. The latest version of the World Bank's standard procurement documents will be used for all procurement when approaching the international market.

32. **Use of borrowers' procurement procedures.** The implementing agencies shall follow World Bank procurement regulation as required by the financing agreement. When approaching the national market, the borrower's own procedures will be used as appropriate and as provided by World Bank procurement regulation. When approaching the national market, the national standard procurement documents used subject to incorporating additional requirements provided in the World Bank Standard Procurement Documents (SPD) for small works, and the agencies' SPD will be reviewed by the World Bank to make sure the provision for application of World Bank Anti-Corruption guidelines and the World Bank's right to audit and all ESF, climate, SEA/SH and ESHS requirements are included.

33. **Procurement of Works, Goods and Non-Consultancy Services:** For procurement of works, goods, and non-consultancy service contract, the implementing agencies' own procurement procedures and SBDs as agreed with and deemed satisfactory to the World Bank will be used, when approaching the national market. Procurement while approaching the international market will be done using the latest version of the World Bank's Standard Procurement Documents. Small value works, goods and non-consultancy service will be undertaken through request for quotation procedures. The request for quotation will indicate the specifications of works, goods, and non-consultancy service as well as the delivery/completion time and the contract award will be based on comparing price quotations from several qualified contractors/suppliers, with a minimum of three, to ensure competition. When the value of the contract of such works, goods and non-consultancy service exceeds the request for quotation threshold and when procured through NCB procedures, the IA SBDs acceptable to the World Bank will be used. Direct contracting shall be used where the PPSD informs so and it is to the benefit of the project and in accordance with the procurement regulation.

34. **Procurement of consultancy services.** Procurement methods to be used are specified in the PPSD. Project staff required for the implementation will be hired following World Bank regulation for positions identified as consultant (IC) and following Project implementation Support Personnel, paragraph 7.32 of Procurement Regulations, for positions not identified as consultants (IC). Paragraph 7.32 of the procurement regulation provides, quote, "Project implementation staff, individuals contracted by the Borrower to support project implementation, other than individual consulting positions identified in the Legal Agreement, may be selected by the Borrower according to its personnel hiring procedures for such activities, as reviewed, and found acceptable by the Bank.", unquote, applies for the project.

35. **Operating costs.** The items to be identified as operating costs in the PPSD will be procured using the Borrower's procurement and administrative procedures subject to review and acceptable to the World Bank including selection of project implementation, non-professional, support personnel not identified as consultant (IC).

36. **Record keeping.** All records pertaining to award of tenders, including bid notification, register pertaining to sale and receipt of bids, bid opening minutes, bid evaluation reports and all correspondence pertaining to bid

evaluation, communication sent to/with the World Bank in the process, bid securities, and approval of invitation/evaluation of bids will be retained by respective agencies and in electronic or hard copy and uploaded in STEP.

37. **Disclosure of procurement information.** The following documents shall be disclosed on the agencies' websites: (a) a Procurement Plan and updates; (b) an invitation for bids for goods and works for all contracts; (c) Request for Expression of Interest for selection/hiring of consulting services; (d) contract awards of goods, works, and non-consulting and consulting services; (g) a monthly financial and physical progress report of all contracts; and (h) an action taken report on the complaints received on a quarterly basis.

38. When approaching the international market (ICB), the following details shall also be published in the United Nations Development Business and the World Bank's external website: (a) an invitation for bids for procurement of goods and works following open international market approaches, (b) Request for Expression of Interest for selection of consulting services following open international market approaches, and (c) contract award details of all procurement of goods and works and selection of consultants using open international market approaches.

39. **Fiduciary oversight by the World Bank.** The World Bank shall prior review contracts according to prior review thresholds set forth in the PPSD/Procurement Plan. All contracts not covered under prior review by the World Bank shall be subject to post review during implementation support missions and/or special post review missions, including missions by consultants hired by the World Bank or third-party independent auditor delegated by the World Bank. To avoid doubts, the World Bank may conduct, at any time, independent procurement reviews of all the contracts financed under the loan. All procurement post reviews are carried out online in STEP. For this reason, uploading of procurement documents of post review contracts should be done in a timely manner and always kept up to date.

40. **Contract Management.** High-risk, and high-value procurement is identified and hence increased contract management support through TA under the project support component is needed. In addition, the agency will develop key performance indicators (KPIs) for such contracts to be identified in the PPSD, and the KPIs will be monitored during actual execution of contracts. The World Bank team will provide additional due diligence and independent review of the contract performance of such identified procurements. A fully staffed PIU will be responsible for overall project/contract management.

Environment and Social risk management arrangements

41. The project's environmental risk rating is "**Substantial**" under the World Bank ESF. The rating is based on the proposed activities which will result in negative and positive impacts. The project implementation arrangements related to the environmental and social safeguard requirements, national legislation, and World Bank environmental and social framework, will be under responsibility of the SPIU. The SPIU will have in its team one Social Safeguard's Specialist and one Environmental Safeguard Specialist to assess, approve, monitor, and report on safeguard's compliance to each activity to be financed under the project that could potentially generate environmental and social impacts on natural resources or/and communities, as well as to train other SPIU staff,

district staff, and communities on issues related to safeguards to monitor the implementation of ESF instruments that will help in the minimising the negative impacts.

Monitoring and evaluation arrangements, reporting, and knowledge management

42. **Monitoring and Evaluation:** The SPIU is staffed with an experienced MIS team, which in addition to M&E functions, also coordinates communication, IT functions and collects necessary data for its GIS system. The same team is also in charge of the same functions for the CDAT project. The SPIU will dedicate at least one M&E specialist for the World Bank funded projects. The Project M&E arrangements will ensure there is adequate monitoring, data collection and reporting across all technical components to capture key information on the project performance, which can be beyond what is tracked in the Results Framework. Based on SAIP I experience, the collected information will also help to capture lessons learned during implementation, so that any corrective and timely actions are taken.

43. **Baseline, midterm, and program evaluation: a Baseline survey will be conducted in the first year of the Project to provide the status on a** set of performance indicators which will be used to track the Project's outcomes and impacts. GAFSP has its own M&E framework, and the baseline survey as well as the project's M&E plan will integrate specific GAFSP core indicators as they will be required for both the GASP six-monthly reports and ex post impact assessment. Independent consultants will be required to conduct surveys required for project evaluation, including establishing the baseline at the start of the project, midterm technical audit and beneficiary assessment, and end-of-project evaluation.

44. **Communication and knowledge management.** The centrality of knowledge sharing and learning as a platform for technical change and innovation rather than the increased use of inputs, is the essential driver of productivity and improved rural livelihoods. It is recommended that the SPIU develop and constantly improve its knowledge services and platforms, stimulate higher rates of engagement and willingness to collaborate in creation of high-value content, and generate new insights that contribute to the established knowledge base and documenting lessons learned for sharing and feeding into policy reforms that can further enhance performance of the agricultural sector.

ANNEX 2: Detailed Description of Project Activities

1. The PDO is to "increase agricultural productivity, market access, and food security of targeted beneficiaries in the project areas".

2. The project will focus on consolidating and expanding the results obtained under the GAFSP funded first SAIP project, the World Bank-funded projects: the LWHP and RSSP3, and other selected MINAGRI-developed schemes. The project will continue the capacity-building activities of the farmers' organizations (WUAs, SHGs, cooperatives) established under these projects, to support them to further increase their productivity, strengthen their organizational and management capabilities, and help them link better to the markets to create additional livelihood opportunities. The project will also further scaleup efforts on NSA and climate resilient agriculture from the previous projects.

Component 1: Institutional Strengthening, Agriculture Productivity Enhancement, and Nutrition Improvement (US$6.81 million)

3. The component will strengthen selected farmer organizations for improved agricultural productivity and healthier household nutrition. Specifically, the project will work closely with youth groups to serve as service providers for specific activities. Further, it will support farmers to shift from subsistence to commercial oriented agriculture.

4. Based on good experiences from SAIP, the project will continue to engage The Food and Agriculture Organization of the United Nations (FAO) to provide technical assistance (TA) to strengthen the capacity of farmer organizations to ensure that they improve their commercial enterprises across the targeted value chains, as well as improve farmer organizational development and governance. The Farmer Field Schools (FFS) approach will continue to be used as in the first SAIP, working closely with MINAGRI, with more orientation towards farming as a business (FAB). The training materials developed from SAIP I will be adapted, to guide in various capacity building efforts.

5. **Sub-component 1.1. Strengthening farmers' organizations:** SAIP I supported at least 1,896 producer-based organizations, including 19 cooperatives as well as self-help groups and WUAs as part of promoting commercial oriented agriculture. Through such efforts, by March 2023, cooperative revenues had increased by 44 percent, or at least Frw 118 million per annum, with prospects for more over the remaining project period. Key lessons emerging indicated the need for more sustained capacity building efforts, as well as addressing capacity gaps to ensure sustainability.

6. The project will support further 1,000 producer-based organizations in the first SAIP as well as the new districts, while aiming to achieve increased cooperatives' revenues by at least 20 percent per annum for each of them. Based on lessons learned from SAIP, the project will continue to strengthen capacity of cooperatives in order to increase their net returns and ensure sustainability, while linking them to markets. The capacity building programs will continue to be adapted (based on varying capacity levels) to cover the following areas: farming as business (FAB), cooperative management, entrepreneurship development, good agricultural practices, post-harvest management, agro-processing and value addition. The project will strengthen the integrated pest management capacity building program and introduce new areas of integrated nutrient management and food quality management, in response to emerging demands, lessons within the food systems. The project will implement specific and tailored capacity building interventions to empower youth and women's leadership and

management skills to address identified challenges and constraints they face so that they actively participate in decision making, promote inclusion and improve their access to agricultural finance and productive services.

7. **Sub-component 1.2. Agricultural productivity enhancement:** This subcomponent will finance: (i) the development of model farms to promote the use of agricultural inputs such as fertilizers, lime, new, hybrid, drought tolerant and disease resistant seed varieties, with high market demand for crop commodities produced down the value chain, and other good agricultural practices; (ii) matching grants and technical assistance to private actors and producer organizations for seeds production; (iii) matching grants for investments in on-farm mechanization across value chains; (iv) awareness and capacity building for farmers and producer organizations to access available agriculture finance and agriculture insurance products in Rwanda (including products available under the CDAT project); and (v) matching grants to finance protected agriculture in both first SAIP and new project areas. To ensure inclusivity, the project will have specific windows of the matching grant facility targeting women, youth, and vulnerable groups, while addressing their specific challenges related to improved agricultural productivity.

8. The first SAIP contributed to increase yields of various crops supported to at least 23 percent since project inception, as a result of use of improved inputs promoted and scaled up through matching grants. The improved agricultural technologies promoted had been highly demanded by the smallholder farmers as evidenced by the high adoption rates. The project will therefore aim to achieve to increase yields by at least an additional 10 percent.

9. **Sub-component 1.3. Improving nutrition outcomes at household level:** Despite efforts to improve nutrition outcomes in Rwanda, child stunting remains very high, at 33 percent, above the World Health Organization (WHO) threshold of 30 percent, hence the need for increased attention. Through SAIP I, the project reached 209,226 people with nutritional services and products, and aimed to increase the food consumption score from 28 percent.

10. The subcomponent will target all Project beneficiaries in the intervention areas by financing activities to increase awareness on utilization benefits of nutritious foods (including fruits and vegetables), to improve dietary diversity through Social Behavior Change Communications (SBCC), capacity building (information on relevant foods like soy and mushrooms) and cooking demonstrations for communities in partnership with the Government's Community Health Workers (CHWs); and (iv) promoting post-harvest storage and management, food preservation and utilization. To increase the uptake of a diverse diet and consumption of nutritious food among the poor households in targeted areas, the project will: (i) facilitate access to planting materials of diverse plant-based food, including bio-fortified crops, mushrooms and fruits; and (ii) ensure availability of animal protein for household consumption through backyard poultry farming.

11. The project will target 70,000 people to receive improved nutrition services (of whom 59,000 people are female), in the existing as well as in the new sites, in order to increase food consumption score of at least 33 percent. One of the criteria for choosing additional or new districts has been the high levels of stunting and malnutrition e.g., Gisagara, Nyamagabe and Ngororero.

Component 2: Irrigation and Water Use Efficiency (US$6.19 million)

12. Component 2 will finance small-scale irrigation, and water use efficient technologies within existing irrigated schemes, and strengthening irrigation capacity to promote climate-smart agriculture. The project will target smallholder farmers, extension workers, and irrigation scheme managers, particularly those in vulnerable

agroclimatic areas, to help improve their resilience to climate variability, increase their crop productivity and profitability, and promote sustainable agricultural practices.

13. The implementation of the component will learn from the diagnostic findings of "Catalyzing Small-scale Irrigation Development in Rwanda: An Assessment of Small-Scale Irrigation Technology (SSIT) Program" (March 2022). The project will integrate some of the key recommendations from the study, including; (i) broaden the eligibility criteria for farmers by including land renting agreements to increase the number of eligible participants' (ii) address inequity by encouraging farmers with smaller land holdings to adopt the "farmers procure" model, and apply for the subsidy as a group and benefit from shared costs and economies of scale; (iii) create synergies with the CDAT project to address financial constraints by raising awareness among financial institutions about the agricultural sector and developing suitable financial products; and (iv) for making the process faster and more transparent by implementing a hybrid digital and paper-based application system and enhancing the monitoring and reporting process through an expanded management information system. The development of the digital system could be financed through the CDAT's innovation challenge program.

14. **Sub-component 2.1. Support Climate Smart and Efficient Irrigation Interventions.** This subcomponent will finance Climate Smart Agriculture (CSA) technologies to help targeted farmers cope with the impact of climate change. This includes access to affordable and sustainable irrigation technologies, and provision of matching grants for small-scale irrigation equipment in line with the Government of Rwanda's (GoR's) subsidized Small-Scale Irrigation Technologies (SSITs) Development Program. The small-scale irrigation technologies will follow climate-resilient design standards and energy-efficiency considerations like solar powered pumps for small-scale irrigation to maximize the project's adaptation and mitigation climate co-benefits, respectively. As per the Government SSIT guidelines, beneficiaries will include individual farmers or groups of farmers owners of consolidated areas covering between 0.5 hectares and 10 hectares. If SSIT beneficiaries are farmers organizations, Subcomponent 2.2 will support the establishment and training of WUAs.

15. Based on the experience of SAIP I, the Project aims to enhance the scalability of successful technologies and practices to improve water use efficiency within existing irrigation schemes, primarily built by previous projects such as the LWH and RSSP. By utilizing successful technologies and implementing more efficient irrigation methods for an additional 600 hectares to SAIP I achievements, this initiative will enable enhanced water management in the current schemes. Moreover, the Project will facilitate access to small-scale irrigation equipment for farmers by offering matching grants and comprehensive support packages, including maintenance assistance and the development of business plans. As a result, an additional 1,000 hectares of agricultural land will be able to benefit from the utilization of small-scale irrigation technologies and techniques. This will be done by identifying, assessing, and piloting new irrigation technologies and best practices which can be scaled up by the Government. Specifically, the project will finance part of the technology (the other part to be co-financed by the beneficiary), provide training and extension services to farmers on the adoption and management of the new technologies and practices, and monitor and evaluate the performance of the new technologies and practices at the farm level, including their impact on crop yields, water use efficiency, and profitability.

16. **Sub-component 2.2. Strengthen irrigation management capacity:** The Project will follow guidance from the new MINAGRI's Irrigation Development Strategic Plan to introduce improved irrigated agricultural management. This subcomponent will finance on-farm training in the handling, assembling, and proper use of different irrigation equipment to improve adaptation rates and improve Irrigation practices among farmers. It will facilitate the establishment of new WUAs and strengthen the organizational capacity and governance of existing ones, and train WUAs and farmer groups on water management, irrigation system operation and maintenance,

and irrigation service fee collection, in existing irrigated schemes. Women and vulnerable groups, like old and disabled farmers, which are currently under-represented will be specifically targeted through sensitivity and capacity training to promote their participation in WUAs and farmer groups and improved access to irrigation services. Specific interventions will be implemented for each of these beneficiary categories to ensure the reduction of identified gaps compared to the rest of beneficiaries. Through a specific program, local youth will be trained in various skills to facilitate the community to sustainably manage the Irrigation schemes.

Component 3: Market Linkages and Value Addition Investments Support (US$4.0 million)

17. As a consolidation and scale-up of efforts undertaken by LWH, RSSP3, and SAIP I, component interventions will enhance market linkages and value addition by strengthening the capacity of farmer organizations and other value chain actors and improving their access to finance. The component implementation will integrate lessons learned from the SAIP I interventions to achieve enhanced outcomes.

18. **Sub-component 3.1. Capacity building to foster market linkages.** The subcomponent will finance training to improve the capacity of farmers' organizations and value chain actors to reduce postharvest losses and enhance the quality of produce, and facilitate linkages to both domestic, regional and international markets. Based on lessons learned from SAIP I, enhanced training and coaching will be organized for beneficiaries to improve food quality and safety, and technical assistance (TA) will be provided to meet required certification standards to ease access to domestic and export markets. Project interventions will aim to improve the organization of local traders in different value chain platforms as well as strengthen linkages between producers and buyers. The TA will complement these to improve postharvest handling, such as the elimination of aflatoxin contamination, and overall quality enhancement in all stages of food products processing, packaging, and preservation. These interventions will directly be linked with activities under component 1, to support business planning skills development for targeted beneficiaries. The Project will create awareness and build capacity for beneficiaries to leverage available access to finance opportunities, including those offered under the CDAT project. The Project will also assist beneficiaries in the dialogue with Financial Institutions, particularly cooperatives borrowing for being able to aggregate produce from member farmers. A specific window for women business initiatives will be created in the matching grants program to facilitate inclusive access to agribusiness opportunities. Specific interventions will be implemented to ensure grants provided to women lead to sustainable income generating activities and are opening more accessing finance opportunities in the private financial sector institutions. The gender and youth mainstreaming strategy reveals gender gaps in access to financial products[31]. As of 2019, about 33 percent of men owned Bank accounts compared to 20 percent of women. Further, the proportion of women accessing loans decreases as the loan size increases.

19. **Sub-component 3.2. Investment support to market linkages.** Through matching grants, the project will continue to finance private investments in assets to enhance market linkages and value addition activities. Eligible investments will be demand driven and market oriented, and include among others drying facilities, collection centers, storage and cold chain equipment, and processing facilities. The matching grants program will enable beneficiaries to access finance based on business plans, including joint business plans between producers and off-takers. TA will be provided to beneficiaries to ensure the supported assets are integrated in functioning business models and have sustainable operation and maintenance mechanisms. For collectively owned assets, a management framework will be established, including the establishment of a management committee, a usage fee

[31] Rwanda Agriculture Gender and Youth Mainstreaming Strategy, 2019, and *Assessing the Implementation, Accountability of "Gender and Youth mainstreaming strategy in agriculture 2019-2026"*, 2021.

structure where appropriate, and a maintenance plan. For cold chain development interventions, the Project will follow guidance and recommendations from the Energy Efficient Cold Storage study, which was carried by the World Bank to provide technical support to the first SAIP, and the Agro-Logistics and Cold Chain Development report prepared by the World Bank in collaboration with FAO Investment Center. The two studies suggest interventions for clean cooling, including solar powered cooling systems, and sustainable operation and management of cold chain facilities and equipment.

ANNEX 3: Economic and Financial Analysis

1. This annex presents the economic and financial analysis (EFA) for the Sustainable Agricultural Intensification and Food Security Project (SAIP) and highlights the benefits associated with investing along value-chains. The EFA also benefits from previous ex-ante project analysis of agriculture projects in Africa and follows the World Bank guidelines.

2. The World Bank approach to EFA seeks to address three questions, in all projects. First, what is the project's development impact? This is an underlying question to cost-benefit analysis, which considers expected stream of project benefits and costs, and establishes an explicit causal framework linking project activities to targeted outcomes. Second, is public sector provision or financing the appropriate vehicle? It probes the rationale for public financing and/or implementation, and explicitly considers alternative modes of financing, such as cascade. Third, what is the World Bank's value added? It examines the Bank's contribution to the project outcomes, and seeks to determine the benefit from Bank's involvement, or whether the proposed project maximizes the development impact.

Project benefits

3. The proposed project will benefit farmers and stakeholders through the following development impacts: (i) strengthened and sustainable farmers' organizations and supporting rural institutions; (ii) sustainable and more resilient production systems; (iii) well-functioning value chains through vertical integration of cooperatives and unions in the value chains; increased shares or produce will be marketed commercially.

4. The proposed project will directly benefit an additional 20,000 new households or approximately 100,000 new individuals. This is a 44 percent increase from SAIP I to SAIP II (45,688 to 65,688 households). Anticipated benefits are likely to continue beyond the immediate beneficiary target numbers. It is realistic to expect additional spillover effects in education and health related areas due to improved diets, improved health and extended lifetime earning capacity with fewer days off work.

Methodology

5. When assessing the benefits of investments, a causal link between upstream and downstream activities is made along the value-chain. In this sense, the value-chain represents the ultimate conduit for directing investments within a food systems approach, from input suppliers, farmers and producer organizations to post-harvest handlers and agribusiness processors. To capture the benefits of transformational change by the project interventions, crop and farm budgets and micro-processor/enterprise models are used to aggregate data up to the project level, using an input-output model for comparison against a base scenario without project intervention. The net incremental benefits are used to calculate the viability of the project using indicators such as the internal rate of return (IRR), benefit-cost ratio (B/C) and net present value (NPV). The timeframe used in the financial analysis is 20 years, with a discount rate of 12 percent, which reflects an average commercial lending rate. The economic analysis evaluates the project's benefits and costs to the national economy over a period of 20 years with a social discount rate of 6 percent.

Financial analysis

6. The commodities and cross-cutting thematic area supported include maize, potato, climbing beans,

tomato, onion, carrot, mango, eggplant, tree tomato, passion fruit, chili (bird-eye and hot), cabbages, French bean and avocado. Six farm models were created, each with a "without" and "with-project" scenario: (i) model 1 for maize and climbing beans; (ii) model 2 for potato and climbing beans; (iii) model 3 for domestic vegetables; (iv) model 4 for domestic fruits; (v) models 5 for export vegetables; (vi) model 6 for export fruits. The farm and micro-processing models intend to capture: (i) improved household income; (ii) increased asset accumulation; (iii) adoption of climate-resilient agricultural production; and (iv) increased market linkage for value-added produce in national and regional markets. In addition, a model was developed for the processing of maize.

7. The financial analysis reveals that the NPVs of the net incremental benefits per hectare range from 1.69 million US$ for beans to US$28.63 million for tomato. Benefit-cost ratios range from 1.19 for beans to 2.37 for tomato. The financial performance indicators indicate the robustness of the crop and farm models, indicating that the proposed activities are commercially viable.

Economic analysis

8. The project generates economic benefits from investments in development pathways related to social capital, sustainable production, and business and market development. These investments lead to development outcomes, including sustainable and strengthened farmer organizations and rural institutions, which are necessary for value chain development, sustainable and more resilient production systems, better functioning integrated value chains with cooperatives and unions, and enhanced value chains among farmers with improved access to national and regional markets, and reduced post-harvest losses that facilitate job creation and income generation. Quantification of these economic benefits is based on benefits accruing from investments along the value chain of the agricultural commodities and cross-cutting thematic area that are supported by the project, using farm and enterprise or micro processing models. The supported commodities and cross-cutting thematic areas include maize, potato, climbing beans, tomato, onion, mango, cabbage, eggplant, carrot, tree tomato, passion fruit, chili (bird-eye and hot), French beans, and avocado. The farm and micro-processing models intend to capture: (a) improved household income; (b) increased asset accumulation; (c) adoption of climate-resilient agricultural production; and (d) increased market linkage for value-added produce in national and regional markets. To capture the benefits of transformational change by the project interventions, crop and farm budgets and micro-processor/enterprise models have been used to aggregate data up to the project level, using an input-output model for comparison against a base scenario without project intervention.

9. The economic analysis evaluates the project's benefits and costs to the national economy over a period of 20 years with a social discount rate of 6 percent and 12 percent for the financial analysis. The net incremental benefits are used to calculate the viability of the project using indicators such as the internal rate of return (IRR), benefit-cost ratio (B/C) and net present value (NPV). The resulting economic net present value (NPV) is about US$42.4 million, the economic internal rate of return (EIRR) is 19.6 percent, and the Benefit-Cost Ratio (BCR) is 3.03. Sensitivity analyses demonstrate that the project can absorb substantial negative impacts and still generate an EIRR above the social discount rate. Thus, the analysis supports the public investment decision.

Table 2: Summary of Economic Analysis of the project

	Yr-1	Yr-2	Yr-3	Yr-4	Yr-5	Yr-6	Yr-7	Yr-8	Yr-9	Yr 10-	Yr-11	Yr-12	Yr-13	Yr-14	Yr-15	Yr-16	Yr-17
Project benefits																	
Total Project Benefits	0	842	-432	605	984	4,203	4,951	3,669	4,786	4,783	25,264	9,956	9,953	8,829	9,946	9,943	8,819
Project costs																	
Economic costs	6,737	8,636	4,627														
Other costs																	
Maintenance and fees				1,000	663	231	231	231	231	231	231	231	231	231	231	231	231
Total Project Costs	6,737	8,636	4,627	1,000	663	231	231	231	231	231	231	231	231	231	231	231	231
TOTAL PROJECT INCREMENTAL NET BENEFITS	-6,737	-7,794	-5,059	-395	321	3,972	4,719	3,438	4,555	4,551	25,033	9,725	9,721	8,598	9,715	9,711	8,588

NPV (in USD '000) @ 0.06	**42,447**
EIRR	**19.6%**
Social discount rate	6%

Project benefit stream	0	842	-432	605	984	4,203	4,951	3,669	4,786	4,783	25,264	9,956	9,953	8,829	9,946	9,943	8,819
NPVb (in USD) @ 0.06	63,340																
Project cost stream	6,737	8,636	4,627	1,000	663	231	231	231	231	231	231	231	231	231	231	231	231
NPVc (in USD) @ 0.06	20,893																
Project net incremental benefits	-6,737	-7,794	-5,059	-395	321	3,972	4,719	3,438	4,555	4,551	25,033	9,725	9,721	8,598	9,715	9,711	8,588
NPV (in USD) @ 0.06	**42,447**																
Break-Even in Year-12	**-6,356**	**-13,292**	**-17,540**	**-17,853**	**-17,613**	**-14,813**	**-11,674**	**-9,517**	**-6,821**	**-4,280**	**8,907**	**13,740**	**18,297**	**22,100**	**26,154**	**29,977**	**33,166**

Switching values	Appraisal value	Switching value	% change
Incremental benefits	63,340	20,893	-67%
Incremental costs	20,893	63,340	203%
BCR	3.03		

	Inc.
Costs	100% *cost*
Benefits	100% *ben*

ANNEX 4: Greenhouse Gas emissions accounting analysis

Corporate mandate

1. In its 2012 Environment Strategy, the World Bank has adopted a corporate mandate to conduct greenhouse gas (GHG) emissions accounting for investment lending in relevant sectors. The ex-ante quantification of GHG emissions is an important step in managing and ultimately reducing GHG emissions and is becoming a common practice for many international financial institutions.

Methodology

2. To estimate the impact of agricultural investment lending on GHG emissions and carbon sequestration, the World Bank has adopted the Ex-Ante Carbon-balance Tool (EX-ACT), which was developed by the Food and Agriculture Organization of the United Nations (FAO) in 2010. EX-ACT allows the assessment of a project's net carbon-balance, defined as the net balance of CO2 equivalent GHG that were emitted or sequestered as a result of project implementation compared to a without project scenario. EX-ACT estimates the carbon stock changes (emissions or sinks), expressed in equivalent tons of CO2 (tCO2-eq) per hectare and year.

Project boundary

3. The Project boundary will be defined as follows:
   a. Climate-smart on-farm production technologies and practices (seeds/planting material, protected agriculture, drip irrigation, crop and post-harvest management, etc.) for horticulture, maize, Irish potatoes, and beans.
   b. Adoption of climate-resilient livestock practices for 25,800 chickens.
   c. Improved fertilizer application, such as compost, DAP, NPK, Urea and organic manure.
   d. Infrastructure: small-scale irrigation for 1600 ha.

Baseline scenario

4. Baseline scenario without project assumed that limited improved agriculture technologies and practices are used.

Data sources

5. Main project specific data sources used for GHG accounting are from FAOSTAT and Rwanda government.

Key assumptions and results

6. The project implementation areas in Rwanda have a tropical climate with moist regime. The dominant soil type is low activity clay. The project implementation phase is 3 years, and the capitalization phase is assumed to be 15 years. The 20 years implementation period is standard in the use of EX-ACT. The net carbon balance quantifies GHGs emitted or sequestered as a result of the project compared to the without project scenario. Over the project duration of 20 years, the project scenario will constitute a net carbon sink of 24320 tCO2-eq, equivalent

to 1216 tCO2-eq per year, 0.29 tCO2-eq per ha per year.

Table 3: Results of the ex-ante GHG analysis

Project Name	*SUSTAINABLE AGRICULTU*	Climate	*Tropical (Moist)*					Duration of the Project (Years)	
Continent	*Africa*	Dominant Regional Soil Type	*LAC Soils*					Total area (ha)	
Components of the project	**Gross fluxes**			**Share per GHG of the Balance**					**Result per year**	
	Without	**With**	**Balance**	**All GHG in tCO2eq**					**Without**	**W**
	All GHG in tCO2eq			**CO_2**			**N_2O**	**CH_4**		
	Positive = source / negative = sink			**Biomass**	**Soil**	**Other**				
Land use changes										
Deforestation	0	0	0	0	0		0	0	0	
Afforestation	0	0	0	0	0		0	0	0	
Other LUC	0	0	0	0	0		0	0	0	
Agriculture										
Annual	0	-175,230	-175,230	0	-180,653		5,422	0	0	-8
Perennial	2,606	-5,799	-8,406	0	0		-4,381	-4,025	130	-1
Rice	0	0	0	0	0		0	0	0	
Grassland & Livestocks										
Grassland	0	0	0	0	0		0	0	0	
Livestocks	0	1,999	1,999				1,772	227	0	1
Degradation & Management	0	0	0	0	0		0	0	0	
Coastal wetlands	0	0	0	0	0		0	0	0	
Inputs & Investments	0	157,317	157,317			71,287	86,030	0	0	7,
Fishery & Aquaculture	0	0	0			0	0	0	0	
Total	2,606	-21,713	**-24,320**	0	-180,653	71,287	88,844	-3,798	130	-1
Per hectare	1	-5	-6	17.0	-43.0	17.0	21.2	-0.9		
Per hectare per year	0.0	-0.3	-0.29	0.8	-2.2	0.8	1.1	0.0	0.0	-

Note: CO2 = carbon dioxide; LUC = Land Use Changes; tCO2-eq = tons of carbon dioxide equivalent.

ANNEX 5: Paris Agreement Alignment Assessment

1. **The project is consistent with the country's climate strategies and the Paris Agreement (PA) commitments**. The project design is well aligned with the 2020 update of the Rwanda's Nationally Determined Contribution (NDC). Commitments made by the agriculture sector towards mitigation measures and adaptation interventions are fully aligned with the objectives of the National Agriculture Policy, and delivery strategies outlined in the PSTA4. Rwanda committed to a reduction of 16 per cent relative to BAU baseline in the year 2030 in the unconditional pathway, and an additional 22 percent decrease with international support. In total, this is a combined unconditional and conditional contribution of 38 percent reduction in Greenhouse Gas (GHG) emissions compared to BAU in 2030, equivalent to an estimated mitigation level of up to 4.6 million tons of carbon dioxide equivalent (tCO2e) in that year. Among the planned mitigation measures, SAIP II will contribute to soil conservation measures and livestock management measures, which in the NDC account for at least half of the agriculture sector's potential. These include conservation tillage, multi-cropping and crop rotation practices, and improved fertilizer efficiency (including compost production and use). Rwanda's adaptation contribution prioritizes 24 adaptation interventions in different sectors, and among these, 6 are in agriculture. This analysis will describe how the proposed project will directly integrate these interventions. These commitments and proposed project interventions are also aligned with the Rwanda CCDR priorities on increasing agriculture's resilience to climate change. For successful implementation of related activities, the CCDR called for agronomic information extension and training of farmers which will be one of the key project interventions to reach its development objectives.

2. **The PA assessment followed the approach for assessing risks and risk reduction measures to demonstrate SAIP II alignment with mitigation and adaptation resilience goals** across two main agriculture subsectors, in which the Project will be intervening which are crop production and agri-food value chains. Irrigation interventions were assessed separately.

3. **SAIP II implementation will follow a value chain approach across its interventions and will therefore include interlinked activities.** The project will support farmers in both rain-fed and irrigated areas, in both areas, interventions will include activities for (i) supporting increased crop productivity and profitability under component 1; (ii) promoting water use efficient technologies in irrigated areas and expanding of areas with small-scale irrigation technologies, under component 2; and (iii) value chain development to enhance market linkages and value addition. **The Project will have several irrigation management interventions and Climate Smart Agriculture (CSA) activities which meet conditions to qualify as Universally Aligned (UA).** These include:

a. Extension services which promote CSA crop production practices;
b. Promotion of drought tolerant and disease resistant seed varieties, with high market demand for crop commodities produced down the value chain, and other good agricultural practices and provision of matching grants and technical assistance to private actors and producer organizations for seeds production;
c. Provision of matching grants to finance protected agriculture including greenhouse farming; and
d. Development of affordable and sustainable irrigation technologies (SSIT), strengthening integrated pest management in project areas, and provision of matching grants for acquisition of small-scale irrigation equipment. SSIT will follow climate-resilient design standards and energy-efficiency considerations like solar powered water pumps for small-scale irrigation.

4. Under its third component, the project will implement activities to improve postharvest handling for

improved quality of produce and reduction of postharvest losses. This will include to finance postharvest assets and TA for their sustainable management. Cold chain development activities will mainstream clean cooling, and include solar powered cooling systems, and capacity building for sustainable operation and management of cold chain facilities and equipment.

5. **With the above activities and the rest of the Project interventions, the climate risk level of SAIP II is considered low, for both mitigation and adaptation aspects.** Planned activities in all three technical components have no or very limited material impact on GHG emissions, and several activities included those listed above, contribute to the transition towards a low GHG-emissions economy, while the very few remaining activities which are part of the GHG-emissive systems are to facilitate basic services for market access by smallholders in addition to ensuring their food security and increased incomes. The GHG emissions accounting gives an analysis (Annex 4) of the net carbon balance of GHGs emitted or sequestered as a result of the project compared to the without project scenario. Over a period of 20 years, the project scenario will constitute a net carbon sink of 24320 tCO2-eq, equivalent to 1216 tCO2-eq per year, 0.29 tCO2-eq per ha per year. Findings from the climate and disaster risk screening which was conducted for the Project reveal that rainy seasons are becoming shorter and more intense, which has resulted in increased erosion and floods risk in the mountainous areas of the country's northern and western provinces. The screening also showed that frequent rainfall deficits and prolonged seasonal droughts will be expected, which will cause problems especially in the east and southeast of the country. The following detailed assessment provides an analysis for assessing risks and risk reduction measures to demonstrate alignment with mitigation and adaptation across subsectors covered by the Project implementation, crop production and productivity enhancement, market linkages and value chain development, and irrigation.

A. 1. Mitigation Step M2: Assessing the risks

M2.1. Is the IPF operation supporting the activities that are on the Universally Aligned list or Universally Non-Aligned list?

6. A significant number of activities are universally aligned (UA) in all sectors financed by the project. However, a few activities are not in the UA list and will further be assessed in the next sections. The table below will provide a summarized description of UA activities and those resulting in low emissions risks.

Table 1: Project Universally Aligned interventions and low risk activities

Activities on the Universally Aligned list	Supported activities with low risks
Crop production and productivity enhancement	
Capacity building for integrated pest management	Proper amounts of chemical fertilizers and pesticides will be used, at the right time and with the right methods. A significant proportion of areas used for crop production will be consolidated in terraced areas where agro-forestry will be promoted to stabilize the terraces and prevent soil erosion.
Promoting the adoption of conservation agriculture to improve soil health and water retention	
Mobilizing farmers for site-specific nutrient management through soil testing to optimize the use of soil nutrients and using mineral and compost manure to fill the deficits	
Irrigation	

Improved water use efficiency in irrigation activities through adoption of water saving equipment (drip irrigation systems, sprinklers, etc.), precise water applications through greenhouse farming, etc.	The use of diesel water pumps for irrigation will receive a significantly smaller rate of subsidies compared to solar powered systems.
Provision of incentives for adoption of solar powered water pumps for small-scale irrigation technologies	
Market linkages and value chain development	
The project will support value addition and other basic processing activities with limited waste and encourage waste recycling interventions.	Market linkages and value addition development support which may require fuel energy for processing activities, transport, and cold chain services. However, project interventions will include incentives for the use of clean alternatives, including the use of solar powered cooling systems, and TA for sustainable operation and management of cold chain facilities and equipment.
The project will incentivize subprojects with solar powered cooling in cold chain interventions	Most of grains and pulse crop products will rely on sun drying methods. However, beneficiaries may require other energy sources, including on-grid electricity, but very few processing activities and cooling services will use GHG emitting diesel powered machineries.
Capacity building and support interventions for improved food quality and safety.	

7. Crop production and productivity enhancement: the Project will promote and finance crop production systems which use climate smart agriculture approaches, across the three pillars of (i) resilience to climate change, (ii) increased agricultural productivity and incomes, and (iii) reduced GHG emissions wherever possible. The project will promote integrated pest management and other soil conservation practices, including crop rotation to manage pests, enhance soil fertility and increase crop stability. Production and use of compost manure will be promoted in the Project areas, by training farmers on how prepare its preparation and its use, and by demonstrating its efficiency through model farms financed by the Project. Model farms will also be used to promote farm mechanization. Chemical fertilizers and pesticides will be used in the proper amount (through soil testing for example), at the right time and with the right methods to significantly reduce how much fertilizer reaches water bodies. A significant proportion of areas used for crop production will be consolidated in terraced areas where agro-forestry will be promoted to stabilize the terraces and prevent soil erosion.

8. Irrigation. The project will implement interventions to expand area under irrigation through SSIT and promote water use efficiency in both SSIT and inherited large schemes (SAIP II will not be developing large schemes). Water-use efficient on-farm irrigation technologies will include drip irrigation, rain pipes, sprinklers, etc. The technologies will generate savings on labor cost and allow for the use of right (and reduced) quantities of water per crop, which will in-turn help to further expand irrigated area. The SSITs will follow climate-resilient design standards and energy-efficiency considerations like solar powered water pumps for small-scale irrigation to maximize the project's climate co-benefits. The project will provide incentives for the uptake of solar powered water pumps and associated irrigation equipment by farmers over diesel systems, by providing significantly higher subsidies on the price for the first (at least 25 percent difference). In large schemes where the Project will be

promoting water-use efficiency technologies, irrigation will rely on gravity-fed systems.

9. Market linkages and value chain development. The project will be supporting maize, beans, Irish potato and horticulture value chains. Most of the interventions in component 3 will be through TA and capacity building for postharvest losses reduction, increased produce quality and food safety, improved access to finance, and to strengthen market linkages. Although primary value addition like drying for grains and pulses will rely on sun drying methods, other processing activities supported by the Project will require other energy sources, including on-grid electricity and to a less extent solar systems, but a few processing activities may use GHG emitting diesel powered machineries. Other potential GHG emissions from market linkages and value addition investments may come from fuel use in transport, cold chain services and waste management. However, project interventions will include the promotion of clean cooling, including the use of solar powered cooling systems, and TA for sustainable operation and management of cold chain facilities and equipment.

M2.2. Are there other means of achieving the Development Objective(s) with lower GHG emissions given the country's unique circumstances, including consideration of the sector-wide decarbonization pathways, where applicable?

10. Crop production and productivity enhancement. The discussion under M2.1 highlighted that most of the interventions of the project will be on the UA list, and for those that are not, the Project will ensure as much as possible that the use of alternative but lower GHG emitting options are mobilized for, and where it is not possible, for example chemical agriculture inputs, measures to optimize their use to reduce their risks will be taken and implemented. These will include the Integrated Pest Management and soil testing to ensure the application of the right quantities of inputs and nutrients and that it is done at the right time. The optimal use of chemical uses combined with the use of organic inputs will still allow the Project to achieve its PDOs.

11. Irrigation. Most of the irrigation interventions are on the UA list, and the remaining GHG emitting activities, mainly diesel-powered water pumps, have alternatives which will be promoted by the Project. As mentioned earlier, the project will provide higher subsidies for solar powered water pumps and associated irrigation equipment to drive up their preference by farmers over diesel systems. The same approach has been used during the implementation of SAIP I, and in less than two years, the uptake of the cleaner options went from 0 to 42 percent. It is expected that the proportion of irrigated areas with solar powered pumps will continue to increase over the project period, and therefore it can be concluded that interventions will have minimal risk on mitigation. The conclusion also takes into consideration that irrigated areas will be about 5 percent of the total areas targeted by the Project.

12. Market linkages and value chain development. The project will support interventions to strengthen market linkages, value addition and processing. These could include activities with potential pre- and post-farmgate GHG emissions, like food processing (maize flour, fruits and vegetable based processed food products, etc.), packaging, transport, generated waste and its disposal, refrigeration, etc. The project will promote alternative renewable energy, recycling and other lower-emission options to increase progressively their uptake to reduce the risk on mitigation. The project matching grants manual will give better scores (and hence higher chances of financing) to processing projects with recycling activities of wastewater and solid byproducts, and which use renewable energy sources or other low-emitting options. Business plans supported by the Project will integrate the implementation of environmental and social management plans which shall ensure there is compliance with what was committed to and other environmental safeguards. As also mentioned previously, SAIP will promote clean cooling and support the TA for sustainable operation and management of cold chain facilities and equipment. The Project will seek to

partner with the Africa Centre of Excellence for Sustainable Cooling and Cold-chain (ACES), which is based in Kigali, to strengthen this TA, and apply the new available best practices. Single use plastic packaging is prohibited in Rwanda, and the project will therefore be promoting other lower GHG emissions alternatives. It may be difficult to find lower GHG emissive alternatives for transport, due to lack of sufficient alternatives in the country. However, the residual risk on mitigation is expected to be moderate, as lower emission options will be promoted and incentivized throughout almost all interventions.

13. Project interventions across the three themes are expected to be net carbon sinks. The very few interventions with components or activities with potential emissions, such as nutrients improvement in crop production, irrigation, or investments agri-food processing facilities; the project will integrate the optimal use of chemical inputs to ensure reduced risks or incentivize low GHG emitting alternatives for soil nutrients improvement and for the remaining activities. As mentioned earlier, in a period of 20 years, the project scenario will constitute a net carbon sink of 24320 tCO2-eq, equivalent to 1216 tCO2-eq per year, 0.29 tCO2-eq per ha per year. Therefore, interventions will by no means undermine the country's ability to advance its decarbonization agenda.

M2.3. Does the IPF operation prevent the transition to lower-carbon alternatives that can achieve the Development Objective(s) as they become viable?

14. The analysis below will show that although a full transition may not be achieved, the risk of higher operation emissions in future is low.

15. Crop production and productivity enhancement: as mentioned earlier the residual risk on mitigation associated to crop production interventions will be low. Conservation agriculture will be promoted by the Project, which combined with the enhanced use of organic compost manure associated with the optimal use of chemical inputs where it may be difficult to use only organic inputs, will still allow the Project to achieve its PDOs. The use of fertilizer inputs in Rwanda by type confirms further the low rating given to the risk on mitigation: about 87.9 percent of farmers use organic fertilizer (and 75.5 percent of all land), while 59.6 percent used inorganic fertilizer (and 37.5 percent of all land)[32].

16. Irrigation: the trends of the uptake in SAIP I areas of the promoted solar powered water pumps for small-scale irrigation which increased to about 42 percent to all farmers using SSIT indicate that the proportion will continue to increase in the next years. Diesel systems were the main GHG emitting activities in the Project irrigation systems, and the gradual projected reduced uptake is not expected to have any impact on the PDO achievement.

17. Market linkages and value chain development: it was demonstrated under M2.2 analysis that although GHG emitting options may not be fully replaced by low-emissive alternatives, especially in transport and energy generation for processing activities; the residual risk on mitigation will be moderate because of environmental safeguards which will be integrated in the operations. The government has also been on the forefront for climate finance mobilization and has also been open to test innovative solutions like the Results Based Climate Financing ((RBCF), in the World Bank financed CDAT project), which confirms further that the likelihood of the use of GHG emissions alternatives to significantly increase in future is low.

18. The project will not prevent the transition to lower-carbon alternatives, it will rather encourage them as much as possible. The provision of incentives, capacity building and mobilization activities which will carried out by

[32] NISR, Seasonal Agriculture Survey 2023A (https://www.statistics.gov.rw/publication/1930), May 2023.

the project, are expected to increase the uptake by farmers of the options that are technically and economically meaningful, such as the optimal use of chemical fertilizers combined with the use of organic inputs, or the use of solar powered systems for water pumps in irrigation, cold chain services or other value addition activities. None of the investments will create long-lived assets that will lock in beneficiaries in a high-energy consumption pathway.

M2.4. Is the IPF operation economically viable after accounting for transition risks?

19. The progressive nature by the GoR which commits in its national strategies for the country to become a green economy country and reduce emissions by 38 percent by 2030, associated with incentives provided by the Project to promote low emissive alternative options in the intervention areas, will make the overall transition risks to be low and will not have negative impacts on sustainable outcomes of the project both during and beyond the implementation period. Additionally, the Government agenda for green growth integrates investments which will accompany the transition and offer alternatives, like partnerships with the private sector for local production of blended fertilizers which will contribute to the optimal use of chemical fertilizers by farmers, or several investments in clean energy generation like methane gas power generation which will offer alternatives for electricity supply. These initiatives will contribute to ensure that any possible risks derived from the pursuit of decarbonization laid out in the NDC will have low negative impacts on the project outcomes in the medium-term.

A.2. Mitigation Step M3: Reducing the risks

Considering a country's unique circumstances, have measures been incorporated to reduce the risk to a low level by (i) addressing constraints and adopting means of achieving the Development Objective(s) with lower GHG emissions, (ii) avoiding preventing the transition to lower-carbon alternatives, and (iii) addressing the transition risks to the economic viability of the operation?

20. The risk assessment part of the analysis (M2) has also described interventions to reduce risks on mitigation across all the three sub-sectors covered by the Project implementation.

21. Crop production and productivity enhancement. Project interventions will promote conservative agriculture technologies and enhance the uptake of integrated pest management practices among beneficiary crop producers. As explained earlier, these interventions will include mobilization for an increased used of organic compost manure, capacity building and soil testing activities to ensure the optimal use of chemical agriculture inputs. This will contribute to reducing the risk on mitigation in project areas.

22. Irrigation. The project will continue to incentivize solar powered water pups for small-scale irrigation. This will be accompanied by the TA to ensure sustainable operation and maintenance of these systems, to reduce the likelihood of farmers using the diesel pumps as a back-up solution. From SAIP I experience, these activities contributed to reducing the proportion of farmers using diesel pumps in favor of lower emitting options. It is therefore expected that the risk on mitigation, which is already low, will further continue to reduce in future.

23. Market linkages and value chain development. In different calls for proposals for matching grants, the Project will be incentivizing low-emissive alternatives in transport and energy generation for processing activities (including in cold chain), and in waste management. All supported business plans will integrate environmental management plans with clear monitoring plans for compliance. The project will continue to provide TA to accompany these measures, in addition to implementing recommendations formulated by previously completed TAs (e.g.: energy efficient cold storage in agriculture, and the agro-logistics and cold-chain development study).

The combination of these project interventions with the strong GoR ambitions to build a green economy in its medium-term strategies, will reduce the risk of continued increases in emission intensity in value chains interventions.

B. 1. Adaptation Step A2: Assessing the risks

24. One of the key selection criteria for new Districts where SAIP interventions will be expanded was areas with risks of shocks arising from erratic rainfall and periodic droughts. This means that the Project would be designed to reduce the impacts of such shocks. A Climate and Disaster Risk Screening for SAIP II was conducted and contributed to this assessment. The screening has revealed the following key findings:

a. In the country's northern and western provinces, rainy seasons are becoming shorter and more intense, which has resulted in increased erosion risk in these mountainous areas of the country. In these areas, heavy rains have caused in the past (including recently in early May 2023) flooding, flash flood events and can trigger landslides and mudslides, leading to infrastructure damage and death. The intensity of heavy rainfall is expected to increase from +3% to +17% and the frequency expected to increase from +9% to +60% by end of the century.

b. During periods of increased aridity, long-lasting dry spells are expected to increase by 0 to +8 days by end of the century. Frequent rainfall deficits are expected in parts of the eastern province (Bugesera, Nyagatare, Gatsibo, Kayonza, Ngoma, Kirehe) and the southern province (Nyanza, Gisagara). Seasonal droughts are expected to be prolonged, which will cause problems especially in the east and southeast of the country (Bugesera, Mayaga, and Umutara). Additionally, water stress during the traditional dry periods (June to August) may be further exacerbated with competing demands from household consumption and agriculture.

c. According to analysis from the German Climate Service Center (GERICS) of 32 Global Climate Models (GCMs), temperatures across Rwanda are expected to increase and projections show a change in annual mean temperature from 1.1°C to 3.9°C by end of the century. There is also the strong likelihood of increased duration of heatwaves by as much as 85 days through the end of the century; cold spells are also expected to reduce. The most significant increase in the number of days over 25°C are expected to occur from October to May, a time coinciding with rainfall and planting seasons for much of the country. Increased heat and extreme heat conditions will result in significant implications for human and animal health, agriculture, and ecosystems.

A2: Are risks from climate hazards likely to have material impact on the operation (including assets, services and the systems as relevant) and its Development Objective (s)?

25. The three subsectors covered by the Project; crop production and productivity enhancement, market linkages and value chain development, and irrigation, could be impacted by climate hazards including changes in precipitation patterns, extreme climate hazards (floods and droughts), and increased temperatures.

26. Large parts of three of the twenty targeted Districts by the Project were significantly affected by drought in the recent past on more than one occasion, and more severely in 2017. During that year, the overall production output and crop productivity was significantly affected. All the three Districts; Kayonza, Ngoma and Kirehe, are all located in the Eastern Province. Irregular rainfall can also affect the central and eastern part of the country

(Bugesera, Nyagatare, Kirehe, Ngoma, Kayonza, Kamonyi, Nyanza, Huye, Ruhango and Muhanga Districts), which are semi-arid type given their position in the rainy shadow of the western highlands. Floods occasionally affect North-Western parts of the country, where there are 3 Districts targeted by the Project: Nyabihu, Ngororero and Rutsiro. The most recent incidence was in early May 2023, when floods caused landslides, 135 fatalities, and close to 6,000 houses and several public infrastructure assets were destroyed.

B. 2. Adaptation Step A3: Managing the risks

A3: Have measures been incorporated into the design of the operation to reduce material risks from climate hazards to an acceptable level?

27. **Change in precipitation patterns**: the project will respond to reduced rainfalls, increased temperatures, and occasional prolonged droughts in the targeted areas in Eastern and Southern Provinces with interventions to expand areas under small-scale irrigation technologies, and in improving water-use efficiency.

28. **The project will facilitate the development of at least 1,000 hectares with small scale-irrigation technologies**. This will be achieved by facilitating access to small-scale irrigation equipment for farmers by offering matching grants and comprehensive support packages, including maintenance assistance and the development of business plans.

29. **The Project will promote water use-efficiency technologies on at least 600 hectares**. Based on the experience of SAIP I, the Project aims to enhance the scalability of successful technologies and practices to improve water use efficiency within existing irrigation schemes, primarily built by previous programs. This initiative will enable enhanced water management in the current schemes, expand both the periods when irrigation can take place and expand irrigated areas.

30. **SAIP II interventions will strengthen irrigation schemes management**. The Project will follow guidance from the new MINAGRI's Irrigation Development Strategic Plan to introduce improved irrigated agricultural management. This will be done through interventions to facilitate the establishment of new WUAs and strengthen the organizational capacity and governance of existing ones, and train WUAs and farmer groups on water management, irrigation system operation and maintenance, in existing irrigated schemes.

31. **Integrated agriculture systems and greenhouse farming will contribute to manage increased temperatures, droughts and other weather events**. The project will be promoting and supporting the integration of agroforestry in crop production. The integration of trees and shrubs with seasonal crop production will provide shade, arrest degradation, maintain soil moisture and fertility, and enhance efficiency of soil nutrients. SAIP I interventions have increased the uptake of greenhouse farming. SAIP II will learn from these interventions to scale up this protected agriculture technology and contribute to control high and low temperatures, intense winds, heavy rainfalls, or hailstorms.

32. **Extreme climate hazards.** The project will primarily be implemented in areas developed by previous programs and projects with sustainable land management technologies (radical terraces and other land husbandry technologies) and irrigation systems. The impacts of floods in these areas should normally be limited because of efficient drainage systems which were taken into consideration when developing irrigated schemes, and water management technologies developed on watersheds in project areas. However, to ensure sustainability of these outcomes, Project interventions will include capacity building of farmers in maintenance of watersheds in

developed areas and support related interventions (protection activities of irrigation canals against siltation, stabilization of terraces embankments with appropriate grasses and agroforestry trees in watershed areas, etc.). Business plans supported outside these schemes will be required to include environmental management plans which provide details on how any climate impacts will be managed.

33. **Other impacts.** Reducing impacts of insects, pests, and pathogens on crops will be done by promoting the use integrated pest management practices. The Project will have an Integrated Pest Management Plan which will guide the implementation of these practices.

It is expected that the above interventions and measures will make the residual risk of the Project acceptable. Any further reduction would not make sense, because it would be either too expensive or it would require technologies that are not technically feasible in the country.

ANNEX 6: Status of the first Sustainable Agricultural Intensification and Food Security Project (P164520)

1. As of June 2023, progress towards achievement of the PDO, overall implementation progress, and fiduciary performance are rated "*Satisfactory*". Environmental and social safeguards are rated "*Moderately Satisfactory."* The project has been under implementation for four and a half years. The number of project beneficiaries reached is 44,104 households (19,769 women-led and 24,335 men-led) and 2,198 producer-based organizations (19 Cooperatives, 8 WUA and 2,2171 SHG). Beneficiary use of improved farming techniques, agriculture inputs (seeds, lime, and compost) and technical assistance have increased productivity of the project supported value chains as summarized in table 1 below.

Table 1: Increase in productivity of targeted crops (tons per hectare) as of June 2023

Crop	Season B 2019	Season B 2023
Beans	1.61	2.00
French beans	4.00	6.65
Chili	7.00	10.99
Irish Potatoes	12.77	18.50
Onions	10.00	17.02
Maize	2.56	3.30
Tomatoes	12.00	18.01

2. To promote horticulture development through protected agriculture, the project has supported the construction of 132 greenhouses via its matching grants program. Beneficiaries supported by the project have exported 1,013 tons of chilis, 153 tons of French beans, 1,830 kgs of snow peas and 1,150 of bitter melons worth 702,838,871 million Rwandan francs. To ensure availability of nutrient-rich foods, the project set up 394 model kitchen gardens and households set up an additional 13,147 kitchen gardens. The project has also distributed 29,000 chickens to 7,250 poor families. Focus has been on reaching pregnant and lactating women, and children under 5 years. To improve irrigation efficiency in the targeted schemes, various irrigation technologies[33] have been installed in project sites covering 1,165 ha. Demand for, and the use of, small-scale irrigation technology (SSIT) has increased to 1,275 ha. To improve post-harvest handling of crops, the project has supported the construction of three storage facilities, two Maize dryers, eight selling points, seven processing facilities, two packhouses, twenty-eight hand washing facilities and the procurement of post-harvest equipment for farmers (2,201 plastic sheets, 57 plastic pallets, 465 hermetic bags and 567 crates).

3. **Achievement of the results targets at year 4 of the project is on track. Four indicator targets have already been surpassed.** Of the 4 **PDO level** results indicators, one has been surpassed – harvested crop yields of the supported value chains in the project areas have increased by 25.91 percent surpassing the target of 17 percent. The three other indicators are on track: (a) 44,104 out of an EoP target of 45,688 farmers have adopted improved

[33] gated pipes, sprinklers, drip-tape, hose-furrow, and rain guns

agricultural technology, of which 19,769 are female farmers out of an EoP target of 19,189; (b) Percentage increase of produced commodities in targeted value chains marketed by participating producers, which is at 22.9 percent out of an EOP target of 25 percent; and (c) Food Consumption Score (currently measured as a percentage) is at 86 percent out of the EoP target of 90 percent. At the **intermediate level**, performance against indicator targets is on track: (i) Increase in annual net revenues made by beneficiary cooperatives is at 54 percent which has surpassed the target of 50 percent; (ii) linkages between 50 farmer organizations and buyers have been established against the EoP target of 52; (iii) the value of contracts negotiated through the established linkages is currently at US$1,960,500 against the target of US$2,000,000; and (iv) the project has produced 35 knowledge products surpassing the EoP target of 20. The majority of the other results targets are on track with most ranging between 75-90 percent achievement.

4. **Project disbursements have improved since the MTR in March 2022.** As of June 30, 2023, the disbursement rate is 100 percent for both the initial grant of US$26.30 million and the AF of US$5.99 million. The Government and beneficiary disbursement and commitments have reached over 90 percent of the planned budget of US$ 6.7 million.

ANNEX 7: Lessons from SAIP I implementation

1. Partnership with youth organizations to deliver extension programs, and in the local production of fruits seedlings has not only contributed to increasing productivity and improving nutrition outcomes among households in targeted areas, but it has also created employment opportunities for some of the youth in cooperatives they were supporting and paving the way for several others to engage in commercial farming, thereby expanding economic prospects.

2. Targeted and specific interventions play a crucial role in enabling cooperatives to enhance their net returns and achieve sustainability, all while establishing strong linkages to markets. Adapting capacity building efforts and other organizational strengthening interventions to the specific conditions of each area, is important to increase and diversify income generating opportunities for each cooperative, individually.

3. Deliberate inclusive interventions to ensure participation of youth and women has had a significant impact on the number of agribusiness initiatives led by these categories of beneficiaries. These initiatives varied from SSIT investments, greenhouse farming, produce aggregation, investments in cold chain services. etc.

4. SAIP introduced the concept of model farms, which are a more enhanced and larger type of demonstration farms incorporating farming for markets aspects, and linkages with buyers. This has facilitated a quick uptake mainly of greenhouse farming, and increased number of market linkages in horticulture farming.

5. Related to the above, lessons from the Project implementation show that strong market linkages facilitate access to inputs and private sector led extension services. Off-takers are often required to advance inputs to farmers which are paid at harvest and provide additional advisory services to ensure they get expected quality and quantity of the produce from farmers.

6. Despite implementing interventions to enhance availability of crop based nutritious foods and animal proteins, it is not always guaranteed that the intended beneficiaries will consume them. Therefore, it is crucial to incorporate frequent monitoring activities aimed at measuring the actual consumption of nutritious diets, which will also inform additional specific corrective interventions if needed.

7. In addition to the importance of focused mobilization to increase the uptake of sustainable irrigation technologies, lessons from SAIP implementation show that farmers prefer solar powered pumps for SSIT than diesel fuel systems, and enhanced O&M capacity building programs are critical to ensure the sustainability use of the technologies.

a. The uptake of SSIT and water use efficient technologies was initially slow when they were introduced by SAIP in its intervention areas. However, after extensive and comprehensive mobilization activities, which covered both information on the irrigation technology and the necessity to have it as an input to a commercial oriented farming, the number of farmers acquiring the required equipment for the technologies increased, and the area covered by the technologies more than doubled in less than 15 months.

b. In SAIP areas, the increase in subsidies by the Government for solar powered pumps for SSIT systems significantly increased the demand of the related equipment compared to the diesel-powered systems equipment. However, as most of these farmers were irrigating and/or using the equipment for the first time, it became critical to enhance capacity building programs for operation, maintenance, and equipment cost

recovery mechanisms for future replacement.

8. Grants programs can play a significant role in promoting an increased number of value addition and processing activities. However, without full enforcement by relevant public agencies, the application of occupational health and safety measures and food safety standards may not always be prioritized. Relevant interventions should therefore be implemented to incorporate these requirements in business plans co-financed by projects' grants schemes.

9. International expertise from the FAO TA team enabled to integrate in the project implementation new water-use efficient technologies and measurement methods, all of which were new in the context of Rwanda. The project also used the TA to get exposed and learn from international best practices in the nutrition improvement interventions and monitoring mechanisms.