Investing in rural people

Rwanda

Kayonza Irrigation and Integrated Watershed Management Project (KIIWP1)

Project Design Report (PDR)

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Currency equivalents

Currency Unit

US$1.0 = RWF 855

Weights and measures

1 kilogram	=	1000 g
1 000 kg	=	2.204 lb.
1 kilometre (km)	=	0.62 mile
1 metre	=	1.09 yards
1 square metre	=	10.76 square feet
1 acre	=	0.405 hectare
1 hectare	=	2.47 acres

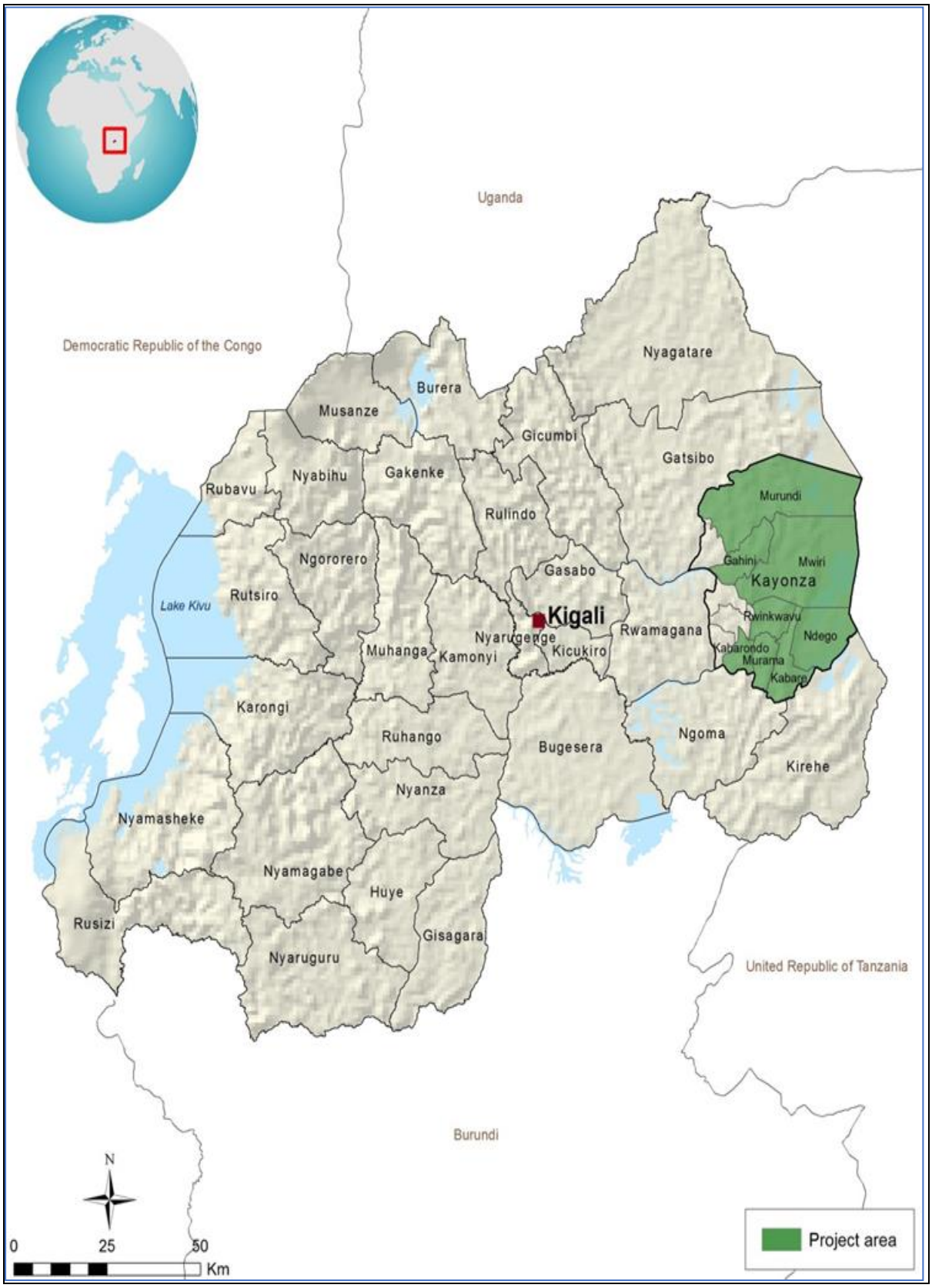
Abbreviations and Acronyms

AfDB	African Development Bank
AFR	Access to Finance Rwanda
AH	Animal Husbandry
AIDS	Acquired Immune Deficiency Syndrome
AWPB	Annual Work Plan and Budget
BDF	Business Development Fund
BDSP	Business Development Service Provider
CESB	Rwanda Capacity Development and Employment Services Board
COSOP	Country Strategic Opportunities Programme
CSA	Climate Smart Agriculture
DFID	Department for International Development
EDPRS	Economic Development and Poverty Reduction Strategy
EFA	Economic and Financial Analysis
EIRR	Economic Internal Rate of Return
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
FaaB	Farming as a Business
FAO	Food and Agriculture Organization
FE	Foreign Exchange
FFS	Farmer Field School
FIRR	Financial Internal Rate of Return
FS	Feasibility Study
GALS	Gender Action Learning System
GAP	Good Agricultural Practices
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GIS	Geographic Information System
GoR	Government of Rwanda
KWAMP	Kirehe community-based Watershed Management Project
HH	Households
HIV	Human Immunodeficiency Virus
HoReCO	Horticulture in Reality Cooperative
IFAD	International Fund for Agricultural Development
IFMIS	Integrated Financial Management Information Systems
IMF	International Monetary Fund
IMTA	Irrigation Management Transfer Agreement
IWMI	International Water Management Institute
IWUO	Irrigation Water User Organisation
KM	Knowledge Management
KOICA	Korean International Cooperation Agency
LPA	Lead Project Agency
LWH	Land husbandry, Water harvesting and Hillside irrigation project
M&E	Monitoring and Evaluation
MIDIMAR	Ministry of Disaster Management and Refugees Affairs
MINAGRI	Ministry of Agriculture and Animal Resources
MINECOFIN	Ministry of Finance and Economic Planning
MINIRENA	Ministry of Lands, Environment, Forestry, Water and Mines
MoU	Memorandum of Understanding
MPCI	Multi Peril Crop Insurance
MT	Metric Ton
MTR	Mid Term Review
NCCLCD	National Strategy on Climate Change and Low-Carbon

	Development
NAEB	National Agriculture Export development Board
NGO	Non Governmental Organisation
NRM	Natural Resources Management
OFID	OPEC Fund for International Development
ORMS	Operational Results Management System
O&M	Operation and Maintenance
p.a.	Per Annuum
PA	Priority Area
PASP	Climate-resilient Post-harvest and Agribusiness Support Programme
PEFA	Public Expenditure and Financial Accountability
PPP	Purchasing Power Parity
PRICE	Project for Rural Income through Exports
PSC	Project Steering Committee
PSTA	Strategic Plan for the Transformation of Agriculture in Rwanda
4P	Public Private Producers Partnership
RAB	Rwanda Agriculture Board
RCA	Rwanda Cooperative Agency
RDDP	Rwanda Dairy Development Project
REMA	Rwanda Environment Management Authority
RNRA	Rwanda National Resources Authority
RSSP	Rural Sector Support Programme
RWF	Rwandan Franc
RWFA	Rwanda Water and Forestry Authority
RYAF	Rwanda Youth in Agribusiness Forum
SCC	Sub-Catchment Committee
SDG	Sustainable Development Goal
SECAP	Social, Environmental and Climate Assessment Procedures
SOE	Statement of Expenditure
SPIU	Single Project Implementation Unit
SSIT	Small-Scale Irrigation Technology
STARS	Strengthening African Rural Smallholders
SUN	Scaling Up Nutrition
SWC	Soil and Water Conservation
TBD	To Be Determined
TOC	Theory of Change
ToT	Training of Trainers
UNEP	United Nations Environment Programme
USD	United States Dollar
VC	Value Chain
WoP	Without Project
WP	With Project
WLUO	Water for Livestock User Organisation
WUO	Water User Organisation

Map of the Project Area

Kayonza Irrigation and Integrated Watershed Management Project



Executive Summary

1. **Political and economic background.** Small and landlocked, Rwanda is a low-income country, with a densely packed population of about 12.5 million people[1] who are mostly under 20-year old, and a total land area of 26,338 km^2 of which 68.7 per cent is classified as arable agriculture land. From a tragically low starting point in 1994, Rwanda has enjoyed political stability in the last two decades which, combined with good governance and policy consistency, has created an enabling policy environment ensuring successful delivery of development programs. Since the turn of the century, Rwanda's Gross Domestic Product (GDP) per capita has increased from US$242 to US$729, and poverty has been reduced from 60.3 per cent to 39.1 per cent of the population.

2. Rwanda's growth in 2016 and early 2017, while below historical standards, remained robust relative to the region, with 2017 growth estimated at 5.2 per cent. Consumer price inflation has continued to decline since February 2017, reflecting improving food supply conditions and declining transport costs. Performance under the PSI-supported program (Policy Support Instrument) and Standby Credit Facility arrangement remained strong, with most quantitative targets and structural reform benchmarks being met. In the most recent debt sustainability analysis by the International Monetary Fund (IMF), Rwanda is assessed to be at low risk of debt distress. Rwanda's external debt portfolio remains mostly constituted of concessional loans[2], and this is expected to continue being the main source of funding for public projects going forward.

3. **Poverty and rural development context**. While Rwanda has an impressive record in translating its sustained growth into poverty reduction, poverty remains a key challenge especially in rural areas. The agriculture sector has proven to be an avenue for propelling the country towards its vision of attaining middle-income status by 2020. The sustainable development of irrigated agriculture as a key driver to boost agriculture production and productivity is fully acknowledged in most of Rwanda's flagship policy documents, and is viewed as fundamental for poverty alleviation and rural development.

4. **Land and agriculture**. Rwanda's land is fragile due to its mountainous topography, thin soil layers and limited vegetative cover. Population pressure has forced settlement on marginal areas, resulting in overgrazing, severe soil erosion, and soil exhaustion, combined with high vulnerability of rural communities to climate and weather shocks. Agriculture is characterized by small production units - the average landholding size is 0.33 hectare, reflecting the high population pressure on the country's natural resource base. About 80 per cent of the rural population consists of subsistence farmers who use mostly rainfed production systems; less than 6 per cent of all cultivated land is irrigated.

5. **Food and nutrition security**. Rwanda has recently subscribed to the Global Compact to end hunger and malnutrition by 2025 and has also joined the Scaling Up Nutrition (SUN) movement. Official estimates show that 19 per cent of households are food insecure, often related to the stability of rural incomes, access to land, ownership of animals, and events such as crop failures and seasonal scarcities, which reduce access to food. Resource-poor households who farm small plots are the most food insecure. While there have been marked reductions in the prevalence of chronic malnutrition over the last decade, almost 38 per cent of children under five are still chronically malnourished. Agriculture has an essential role to play in overcoming the remaining barriers in chronic malnutrition by enabling rural households to improve the quality of their diets and food system.

[1] 2018 Estimate, http://worldpopulationreview.com/countries/rwanda-population/.

[2] 72% as end June 2017.

6. **Impact of climate change induced droughts.** Climate change has resulted in Rwanda experiencing frequent and recurrent mid-season droughts. Recent rainfall trends show that rainy seasons are tending to become shorter but with higher intensity. While the North and South Provinces suffer from severe landslides and soil erosion due to heavy floods, the Eastern Province is regularly affected by drought events leading to decreases in agricultural production and livestock deaths. The economy of Kayonza District is mostly dependent on agriculture and livestock, which occupy the majority of the labour force. The district has fertile soils in almost all its sectors, permitting the growth of most types of crops. Although a significant proportion of land is unexploited, the majority of farmers cultivate small plots (0 to 1 hectare).

7. **Project rationale.** In 2016, the Eastern Province was affected by a severe drought that brought an additional burden to the systemic challenges faced by Rwandan farmers in terms of land pressure, loss of soil fertility due to unsustainable environment management practices and inadequate farmer participation in rural development planning. More than 47,000 households in the districts of Kayonza, Nyagatare, Gatsibo Ngoma and Kirehe became food insecure and the Government of Rwanda (GoR) had to provide food relief and water for livestock to support the affected districts.

8. Along with its strategy to mitigate the drought-induced calamities through improved use of untapped water resources, the Government has thus requested IFAD to formulate a new integrated irrigation and watershed development project, revolving around the most seriously affected district of Kayonza, and building on the experience of the recently completed KWAMP, the successful Community-based Watershed Management Project implemented in the neighbouring Kirehe District.

9. **Lessons learned.** KIIWP design builds on the strengths and lessons learned in the implementation of KWAMP but also the ongoing Project for Rural Income through Exports (PRICE) and Post-harvest and Agribusiness Support Project (PASP), and the just initiated Rwanda Dairy Development Project (RDDP) which has a significant emphasis on engaging with policy makers and other relevant stakeholders as well as assisting the government with the design and implementation of specific regulatory policies related to the dairy value chain (VC).

10. **Goal and development objective.** KIIWP's Development Goal is to 'Contribute to poverty reduction in the drought prone Eastern Province of Rwanda'. The Development Objective is to 'Improve food security and incomes of 50,000 rural households on a sustainable basis' and build their climate resilience. KIIWP will improve the resilience of smallholder farmers to droughts and effects of climate change through increased levels of production and productivity of selected food and cash crops, livestock and improved market access and business development. Through KIIWP, it is expected that smallholder farmers will see an improvement in household food and nutrition security, income and asset ownership, particularly amongst vulnerable groups including women-headed households and youth. KIIWP's goal will be achieved through the development of sustainable, profitable and intensive small-scale agricultural activities supported through Public Private Producers Partnerships (4Ps) whenever opportunities exist in the selected project sites and areas.

11. **Project outcomes.** The main expected outcomes and outputs of the project include (i) improved access to land, forests, water and water bodies for production purposes; (ii) increased acreage of farmland under water-related infrastructure; (iii) increased acreage of farmland under climate resilient management and practices; (iv) increased capacity of smallholder farmers and local government to sustainably manage natural resources and climate-related risks; (v) enhanced use by farmers, including youth, of technologies, equipment and infrastructure adapted

to smallholder agriculture; and (vi) increased farmers' economic benefits from market participation and increased sales.

12. **Strategic commodities** will be supported by KIIWP that are central to the main livelihoods of the farmers in Kayonza District and for both provision of staple food and income generation. Paddy, maize, potatoes, soya, as well as horticulture are anticipated to be KIIWP major crops.

13. **Project area**. The project area comprises the eight drought-prone sectors of the District of Kayonza in the Eastern Province of Rwanda. These sectors, namely Gahini, Kabare, Kabarando, Murama, Murundi, Mwiri, Ndego and Rinkwavu are relatively hot, with limited rainfalls - averaging 900 mm per year - compared to the rest of the country, but have good potential for irrigation. The project area has a population of 262,967 people, of which 51.5 per cent are women, who face a serious challenge of water scarcity during nearly all dry months of the year. The landholding per capita of 0.5 hectare per household is moderately large compared with the rest of the country. In the eight sectors targeted by the project, in addition to crop production, 58 per cent of all households raise some type of livestock, 24 per cent have cows.

14. **Target group**. Based on the national wealth ranking system (*Ubudehe*), and consistent with the targeting strategy laid out in the Country Strategic Opportunities Programme (COSOP), KIIWP's direct target groups will comprise about 50,000 poor and food insecure rural households (HH) representing 225,000 persons who belong to the poorest *Ubudehe* categories 1, 2 and 3[3].

15. **Targeting strategy.** KIIWP will reach the target group through various targeting mechanisms – geographic, self, direct, empowering and procedural. It is expected that women and youth will account for at least 50 per cent and 30 per cent of total beneficiaries respectively. Particular targeting mechanisms will be employed to ensure effective participation of women, women-headed households and youth through specific capacity building interventions targeted at these groups. Gender Action Learning System (GALS) will be used to improve equal access of men and women to economic opportunities, decision-making processes and share of workload. Youth will be particularly targeted as both beneficiaries and service providers through the young graduate programme initiated by MINAGRI to provide technical and managerial assistance to farmers' cooperatives, Water User Organisations (WUOs) and Water for Livestock User Organisations (WLUOs).

16. **Alignment.** KIIWP will be well aligned with IFAD corporate policies *esp.* on youth, gender, climate/environment, private sector, rural finance and nutrition. The project will contribute to strategic objectives (SOs) 1 and 2 of the draft new Rwanda COSOP 2019-2024. Specifically, it will sustainably increase agricultural productivity in food crop value chains (SO1) and strengthen market linkages between farmers and other value chain actors (SO2). In this regard, KIIWP will also contribute to the SOs in IFAD's Strategic Framework (2016-2025) to increase rural people's productive capacities, increase their benefits from market participation and strengthen the environmental sustainability and climate resilience of their livelihoods.

17. KIIWP will also directly contribute to the attainment of several Sustainable Development Goals (SDGs), notably SDG 1 (No Poverty, Target 4); SDG 2 (Zero Hunger, Targets 1 to 4); SDG 5 (Gender Equality); SDG 8 (Decent Work and Economic Growth, Targets 2 and 3); SDG 13 (Climate Action, Target 1 and 3) and SDG 15 (Life on Land, Target 1 and 3).

[3] Cat*. 1:* Families who do not own a house or cannot pay a rent, have a poor diet and can hardly afford basic household tools and clothes; *Cat. 2:* Those who have a dwelling of their own or are able to rent one, mostly get food and wages from working for others but rarely get full time jobs; and *Cat. 3:* Those who have a job and farmers who go beyond subsistence farming to produce a surplus which can be sold. The fourth category (not targeted by KIIWP) includes people who earn high incomes; people who own houses; people who can afford a luxurious lifestyle.

18. KIIWP will be implemented in two distinct phases. The two phases will be subject to distinct approval and financing processes, with the submission of KIIWP 2 for Executive Board approval at the end of KIIWP 1. The rationale for the phased approach is for KIIWP 1 to: respond to the urgent demand of the Government of Rwanda to tackle drought-related issues in the Eastern Province within the shortest possible time and to conduct the Feasibility Studies (FS) and Environmental and Social Impact Assessments (ESIA) and validate the irrigation schemes ahead of large irrigation development and farm business development support in KIIWP 2.

19. **KIIWP 1 will comprise two components:**

- ***Strengthening resilience to droughts***: this component will invest in catchment rehabilitation, livestock and domestic water infrastructure development, and the establishment of efficient infrastructure management institutions. Specific Environmental and Social Management Plans (ESMPs) for these activities will be prepared during implementation, as the location of the sites are identified, prepared and implemented. Feasibility studies and ESIAs will be undertaken for four potential irrigation schemes in the District. In addition, 5,000 hectares of area will be studied to prepare a pipeline of investment-ready irrigation schemes in case the pre-identified schemes fall short of the target area for development.
- ***Institutional development and project coordination***: this component will provide the institutional, managerial and administrative support services needed to implement the above technical component. Key interventions include: (i) the capacity building of KIIWP implementation staff under the SPIU at the local and national level; and (ii) gender and youth mainstreaming. Opportunities to support the development and implementation of national policies, strategies and/or regulations related to the project interventions will be prioritized.

20. KIIWP 1 will revolve around (i) the catchment rehabilitation and protection of areas where rainfed agriculture is practised; (ii) the provision of water for livestock and domestic purpose in the most drought-prone sectors of Kayonza; (iii) the preparation of the FS and ESIAs for large irrigation schemes; and (iv) the formation and capacity building of sub-catchment committees, WLUOs, district and scheme committees. All of these activities can be implemented as soon as the project is approved and will efficiently pave the way for smooth and fast rolling out of the main investments foreseen in KIIWP 2.

21. **This PDR mainly focuses on the proposed activities and implementation arrangements for KIIWP 1.** As explained above, the two phases will be subject to distinct IFAD Executive Board approval and financing processes, and the activities expected to take place in KIIWP 2 will be fine-tuned according to the results of the FS and ESIAs to be produced and disclosed in accordance with the national environmental regulations and SECAP guidelines. Feasibilities studies and ESIAs are expected to be ready by December 2020. This will allow to further shape and finalize the design of KIIWP 2. Out of a total project duration of six years, KIIWP 1 is expected to last 2.5 years and KIIWP 2 will cover the remaining 3.5 years. Some activities initiated in KIIWP 1, like the capacity building of district & scheme committees, sub-catchment committees and WLUOs might be continued based on their status and strength assessed towards the end of KIIWP 1.

22. The anticipated components and activities in KIIWP 2 comprise:

- ***Strengthening resilience to droughts***: this component will promote climate smart agriculture for irrigated and rain-fed lands through Farmer Field Schools. It will include investment on water harvesting and storage, irrigation infrastructure development and marshland development. This component will also include the promotion of good nutritional practices and the GALS.

- ***Support to farm business development***: this component will assist farmers to take advantage of the investments made under the component on strengthening resilience to droughts by strengthening their organizational and entrepreneurial skills and improving their backward and forward linkages to access input, service and output markets.
- ***Institutional development and project coordination***: this component will continue supporting the project as described under KIIWP 1.

23. The main expected outcomes at the end of KIIWP 1 and KIIWP 2 combined include: (i) improved access to land, forests, water and water bodies for production purposes; (ii) increased acreage of farmland under water-related infrastructure; (iii) increased acreage of farmland under climate resilient management and practices; (iv) increased capacity of smallholder farmers and local government to sustainably manage natural resources and climate-related risks; (v) enhanced use by farmers, including youth, of technologies, equipment and infrastructure adapted to smallholder agriculture and (vi) increased economic benefits by farmers from market participation and increased sales.

24. **Project costs and financing KIIWP 1.** KIIWP 1 total costs, including physical and price contingencies are estimated at US$20.93 million (RWF 18.7 billion), of which US$20.03 million are baseline costs and US$0.9 million are allowances for physical and price contingencies. The costs broken down by project component are as follows: (i) Strengthening resilience to droughts: US$16.92 million (82 per cent); (ii) Institutional development and project coordination: US$3.1 million (18 per cent). KIIWP I will be financed by: (i) IFAD up to US$17.79 million (85 per cent), through a highly concessional loan; (ii) Government of Rwanda for a total of US$2.83 million (13.5 per cent) in the form of tax exemptions and consultancies for the Ndego irrigation scheme; (iii) DFID for a total of US$0.3 million (1.5 per cent) in the form of consultancies for Ndego irrigation scheme.

25. The estimated costs for KIIWP 2 are approximately US$59 million (RWF 53 billion), including US$3.7 million in contingencies, broadly broken down by project component as follows: (i) Strengthening resilience to droughts: US$44 million; (ii) Support to farm business development: US$8 million; (iii) Institutional development and project coordination: US$4 million. KIIWP 2 is expected to be financed by: (i) IFAD up to US$26 million, through a highly concessional loan; (ii) Private sector for US$322 thousand; (iii) ICCO for US$ 246 thousand, (iv) Government of Rwanda for a total of US$9 million in the form of tax exemptions; (v) Co-financiers for a total of US$22 million; and (vi) Beneficiaries for US$2 million.

26. **Co-financing arrangements.** It is anticipated that the total IFAD loan for KIIWP (KIIWP 1 + KIIWP 2) would amount to about US$43.4 million, to be sourced from IFAD 11 financing cycle. Several development partners *esp.* the Korean International Cooperation Agency (KOICA), but also the African Development Bank (AfDB), the OPEC Fund for International Development (OFID), the Spanish Government and the European Union (EU) have expressed interest in co-financing KIIWP 2 once the results of the feasibility studies and Environmental and Social Impact Assessments will be disclosed. DFID has already provided funds to the Government of Rwanda for the Environmental and Social Impact Assessment in the Ndego sector. In case the level of co-financing for unexpected reasons will not be sufficient to fill the potential US$22 million financing gap in KIIWP 2, resources under IFAD 12 financing cycle will be accessed.

27. **The economic and financial analysis (EFA) of KIIWP 1** shows that the project would be profitable with an Economic Internal Rate of Return (EIRR) of 15.06 per cent and a Net Present Value (NPV) of US$1.03 million at a 12 per cent economic discount rate. Sensitivity analysis carried out shows that the economic profitability of KIIWP 1 would remain satisfactory even if the project costs increase by 21 per

cent, the project benefits decrease by 18 per cent or if the benefits lag behind by two years. Economic benefits derive from increased value of agricultural production and the value of improved access to water for domestic and livestock uses. Benefits also include the improvement of living conditions and nutrition, the positive spill-over effects of capacity building on the local community, and reduced land lost due to soil erosion control.

28. The overall EFA shows that KIIWP 1 and KIIWP 2 are financially profitable for rural households engaged in agricultural production with financial internal rate of return for farmers ranging from 20 to 27 per cent depending on the production system. The sensitivity analysis shows that the economic profitability would remain satisfactory even if the project costs increase by 46 per cent, the project benefits decrease by 31 per cent or if the benefits lag behind by two years.

29. The preliminary **environmental and social category is A.** However, KIIWP 1 activities are classified as category B, given that interventions focus on preparatory studies for irrigation schemes, integrated watershed management and planning activities. KIIWP 2 will include investments on water harvesting and storage, irrigation infrastructure development (area >100 hectares) and marshland development, that may be categorised as A.

30. **Project implementation arrangements.** KIIWP 1 institutional arrangements are fully aligned with the current implementation framework of IFAD-funded projects in Rwanda. The already established Single Project Implementation Unit (SPIU) is strategically positioned to manage KIIWP with benefits such as (i) realization of economies of scale and reduction of transaction costs; (ii) improved coordination and creation of synergy; (iii) efficiency and effectiveness in project implementation oversight through improved M&E; (iv) improved staff retention leading to reduction in staff turnover and increase in institutional memory, and (v) increased knowledge and expertise as well as best practices in project management.

31. The Lead Project Agency will be the Rwanda Agriculture Board (RAB) under the auspices of the Ministry of Agriculture and Animal Resources (MINAGRI). RAB has the general mission of championing the agriculture sector development into a knowledge based; technology driven and market-oriented industry, using modern methods in crop, animal, fisheries, forestry and soil and water management in food, fibre and fuel wood production and processing. District implementation will follow the devolution principle and day to day management of KIIWP 1 will be delegated by RAB to a District-level Project Coordination Unit (PCU) within the District of Kayonza which will be the main executing agency of KIIWP 1 at the district level.

1. Context

National context and rationale for IFAD involvement

National context

1. **Political and economic background.** Small and landlocked, Rwanda is a low-income country, with a densely packed population of about 12.5 million people and a total land area of 26,338 km^2 of which 18,095 km^2 is classified as arable agriculture land. From a tragically low starting point in 1994, Rwanda has enjoyed political stability in the last two decades. Since the turn of the century, Rwanda has seen its economy grow by 7.9 per cent per year, such that it is currently more than 3.5 times larger than it was in 2000. In the same period, GDP per capita has increased from US$242 to US$729, and poverty has been reduced from 60.3 per cent to 39.1 per cent of the population.

2. Rwanda's growth in 2016 and early 2017, while below historical standards, remained robust relative to the region, with 2017 growth estimated at 5.2 per cent. Consumer price inflation has continued to decline since February 2017, reflecting improving food supply conditions and declining transport costs. In the most recent debt sustainability analysis by the International Monetary Fund (IMF), Rwanda is assessed to be at low risk of debt distress. Rwanda's external debt portfolio remains mostly constituted of concessional loans, and this is expected to continue being the main source of funding for public projects going forward.

3. **Poverty and rural development context.** Rwanda is ranked 158th in the 2017 Human Development Index[4]. Significant socio-economic developments over the past couple of decades include steadily decreasing birth rates per woman (from 7.2 in 1990 to 3.9 in 2016), rising literacy rates among adults and youth (from 64.9 per cent and 77.6 per cent in 2000 to 70.8 per cent and 85.1 per cent in 2014) and widespread improvements in health, leading to markedly improved life expectancy at birth (from 34 years in 1990 to 67 years old in 2016).

4. While the country has an impressive record in translating its sustained growth into poverty reduction, poverty remains a key challenge especially in rural areas[5]. Agriculture is estimated to have a share of 79 per cent in Rwanda's total employment, and 84 per cent of its workers are estimated to be poor, i.e. having less than Purchasing Power Parity (PPP) of US$2 per day. The agriculture sector has proven to be an avenue for propelling the country towards its vision of attaining middle-income status by 2020. The sustainable development of irrigated agriculture as a key driver to boost agriculture production and productivity is fully acknowledged in most of Rwanda's flagship policy documents and is viewed as fundamental for poverty alleviation and rural development.

5. **Land and agriculture.** The Rwandan economy is still for the foreseeable future dependent on the agricultural sector which employs around 70 per cent of the population, provides 91 per cent of the food consumed in the country, accounts for 70 per cent of export revenues, and contributes 32.7 per cent of the GDP.

6. Rwanda's land is fragile due to its mountainous topography, thin soil layers and limited vegetative cover. Population pressure has forced settlement on marginal areas, resulting in overgrazing, severe soil erosion, and soil exhaustion, combined with high vulnerability of rural communities to climate and weather shocks. Agriculture is characterized by small production units – the average landholding size is 0.33 hectare, reflecting the high population pressure on the country's natural resource base. About

[4] Out of 188 countries and based on composite statistic on life expectancy, adult literacy rate, annual GDP, etc.

[5] Poverty in Rwanda has incidence of 43% in rural areas compared to 22% in urban areas.

80 per cent of the rural population consists of subsistence farmers who use mostly rainfed production systems; less than 6 per cent of all cultivated land is irrigated. Land remains a binding constraint and generally calls for production intensification as the only environmentally sustainable pathway for continued growth of the agricultural sector.

7. The economy of Kayonza District is mostly dependent on agriculture and livestock, which occupy most of the labour force. The district has fertile soils in almost all its sectors, permitting the growth of most types of food. Although a significant proportion of land is unexploited, the majority of farmers cultivate small plots (0 to 1 hectare). The district has a good network of rural tracks and roads connecting it to other districts but has only three modern markets. The rural financial sector is also underdeveloped resulting in only 37 per cent of the district population with access to finance.

8. Improvements in the agriculture sector in the past decade have principally been driven by interventions in land management, input provision, and irrigation. The crop-livestock intensification agenda continues to be critical. Significant interventions have driven productivity gains, including implementation of the Land-Use Consolidation Policy and Crop Intensification Program, expansion of irrigated areas, and more productive utilization of extensive fertile marshlands areas. Table 1 shows the notable increases in yields for the main commodities.

Table 1: Food crop production in Rwanda from 2014 to 2018 ('000 tons)

Crops	**2014**	**2015**	**2016**	**2017**	**2018**
Total Crops	**2,349**	**2,408**	**2,493**	**2,590**	**2,889**
Cereals	**353**	**368**	**401**	**425**	**434**
Sorghum	40	31	48	42	37
Maize	284	295	300	324	333
Wheat	3	3	4	4	6
Rice	26	39	49	55	58
Legumes	**242**	**257**	**261**	**156**	**263**
Beans	233	245	249	145	251
Soya	9	12	12	11	12
Roots & tubers	**1,218**	**1,240**	**1,280**	**1,405**	**1,587**
Irish potatoes	339	335	370	379	439
Sweet potatoes	511	503	504	575	662
Cassava	368	402	406	451	486
Bananas	**368**	**378**	**379**	**416**	**406**
Vegetables and fruits	**168**	**165**	**172**	**188**	**199**

Source: National Institute of Statistics of Rwanda (2018)

9. The market for horticultural produce is growing, with the rapid rate of urbanization in Rwanda strongly increasing domestic demand. The demand for horticulture exports is also on the rise and cross-border trade is another substantial and profitable market during the dry season when regional horticultural production is low. Indeed, the horticulture sector is viewed as highly strategic by the GoR in terms of export revenues, and the National Agricultural Export development Board (NAEB) is intensifying its support to the sector through various interventions: modern packhouse

in Kigali, promotion of Rwanda Fresh brand, establishment of accredited testing laboratories, etc.

10. Agricultural development is also being driven by the increasing involvement of the private sector. Local governments also play an important role in agricultural development through the decentralisation process. The Ministry of Agriculture and Animal Resources (MINAGRI) continues to provide strategic direction and coordination in the sector, while Districts have been given a leading role in the implementation of agricultural strategies, through the decentralization of functions and budget.

11. The Land Tenure Regularisation Programme registered all the land in Rwanda (10.3 million parcels) for the first time over a period of five years (up to 2013). This significantly increased tenure security for both female and male landowners. It is mandatory to register land property to both spouses married in a community and spousal consent is now required for transfer of the property. Current land laws provide for equal access to land without discrimination based on sex or origin. In case of State land acquisition, owners of land are compensated.

12. **Food security**. Rwanda has recently subscribed to the Global Compact to end hunger and malnutrition by 2025. Official estimates show that 19 per cent of households are food insecure, often related to the stability of rural incomes, access to land, ownership of animals, and events such as crop failures and seasonal scarcities, which reduce access to food. Resource-poor households who farm small plots are the most food insecure. In the target Kayonza District, 43 per cent of households are marginally food secure, 10 per cent are moderately food insecure and 1 per cent are severely food insecure.

13. **Relevant national policies and strategies.** Rwanda's long-term development goals are defined in the Vision 2020 and Vision 2050 documents that aim to transform the country from a low-income agriculture-based economy into a knowledge-based, service-oriented economy with middle-income status. The GoR has ambitions to move towards being an Upper Middle Income country by 2035, requiring an average annual growth rate of 10 per cent. To achieve this, the GoR has come up with a medium-term strategy: the *second Economic Development and Poverty Reduction Strategy* (EDPRS 2) outlines its overarching goal of growth acceleration and poverty reduction through four thematic areas: economic transformation, rural development, productivity and youth employment, and accountable governance. The GoR conducted a mid-term evaluation of its EDPRS 2 in July 2017. Areas for further attention going forward include among others **using PPPs to unlock business potential**; **modernizing agriculture and increasing resilience to climate change**, all areas that constitute the backbone of KIIWP's design.

14. The project also meets the objectives and priority areas of other key policies and strategies such as the *Strategic Plan for the Transformation of Agriculture* (PSTA 4) – the Government's flagship investment programme for the sector, the *National Strategy on Climate Change and Low-Carbon Development* (NCCLCD) for Green Growth and Climate Resilience and the *Nationally Determined Contributions* (NDCs).

Special aspects relating to IFAD's corporate mainstreaming priorities, including:

15. **Climate change.** Climate change has resulted in Rwanda experiencing frequent and recurrent mid-season droughts. Recent rainfall trends show that rainy seasons are tending to become shorter but with higher intensity. While the North and South Provinces suffer from severe landslides and soil erosion due to heavy floods, the

Eastern Province, including Kayonza District, is regularly affected by drought events leading to decreases in agricultural production and livestock deaths[6].

16. **Gender.** Rwanda has made great strides promoting gender equality, with strong Government backing. International indices that measure progress towards gender parity rank it among high income countries with high levels of human development. However, many of the benefits of this progress have yet to be felt in rural areas, where traditional patriarchal attitudes continue to prevail. Women provide the bulk of labour (86 per cent) in the agricultural sector. Yet, with lower levels of schooling and higher rates of illiteracy (23 per cent) they are constrained to subsistence farming with insufficient skills, access to markets and control over land and other key assets and agricultural services, compared to men. In male-headed households, women also work double the hours of men, on productive, domestic and community work. Rates of domestic violence, and tolerance for it by men and women, are relatively high. All of these result in a cycle of gender inequality and poverty that transcends generations.

17. **Youth.** Over 50 per cent of the population is under 20 years old and the median age is 22.7 years old. The 2015 National Youth Policy officially revised the definition of youth to people aged between 16 and 30 years old. Youth unemployment is relatively low (4.1 per cent) and more of an urban problem. Youth inactivity (37 per cent) mainly stems from young people still in education (75 per cent) or looking after their families (16 per cent). Two-thirds of employed youth work in agriculture, but the sector is characterized by low productivity, low earnings and precarious working conditions. Challenges to youth entrepreneurship and business development include a lack of collateral to access finance, business and management skills, bankable business plans, innovation and information technology as well as high interest rates. The Youth Policy thus identifies the modernisation of agriculture as a priority, especially by linking and improving farm value chains.

18. **Nutrition.** While there have been marked reductions in the prevalence of chronic malnutrition over the last decade, stunting continues to be above the World Health Organisation (WHO) high severity threshold and is a major public health concern. Almost 38 per cent of children under five are chronically malnourished.[7] Only three districts have moderate stunting rates (<30 per cent). The persistent underlying causes of stunting in rural areas include: poor access to improved water and sanitation facilities by infants and children; inadequate infant feeding to meet minimum meal frequency and diet adequacy needs; food insecurity from subsistence farming on small plots of land; poor diet diversification leading to micronutrient deficiencies; and seasonal and chronic obstacles and climate shocks limiting access to mostly market-sourced food items. Rwanda joined the SUN movement in 2011 and several multi-stakeholder platforms have been set up at central and local level to scale up nutrition. Agriculture has an essential role to play in overcoming the remaining barriers in chronic malnutrition by enabling rural households to improve the quality of their diets and food system.

Rationale for IFAD involvement

19. In 2016, the Eastern Province was affected by a severe drought that brought an additional burden to the systemic challenges faced by Rwandan farmers in terms of land pressure, loss of soil fertility due to unsustainable environment management

[6] The water requirement satisfaction index using maize as a proxy indicator for drought prone areas shows that Eastern Province of Rwanda is the most vulnerable to drought events. The Eastern belt of Rwanda covers the districts of Bugesera, Gatsibo, Kayonza, Kirehe, Ngoma, Nyagatare and Rwamagana.

[7] Malnutrition is costing Rwanda a lot. The Cost of Hunger Study conducted by key ministries in 2013 concluded that undernutrition in children costs the country around USD 90 million every year in related illnesses and health care needs. It also estimates that 13.5% of all students who repeated grades at school in 2012 did it because of stunting.

practices and inadequate farmer participation in rural development planning. More than 47,000 households in the districts of Kayonza, Nyagatare, Gatsibo Ngoma and Kirehe became food insecure and the GoR had to provide food relief and water for livestock to support the affected districts.

20. Along with its strategy to mitigate the drought-induced calamities through improved use of untapped water resources, the GoR has thus requested IFAD to formulate a new integrated irrigation and watershed development project, revolving around the most seriously affected district of Kayonza, and building on the experience of the recently completed KWAMP, the successful Community-based Watershed Management Project implemented in the neighbouring Kirehe District.

21. KWAMP is one of the most highly ranked supported projects in the IFAD East and Southern Africa (ESA) division. The supported activities of crop and livestock intensification, irrigation development and improvement in feeder road network contributed to improved agricultural productivity and enhanced food security in Kirehe District. The 2016 Impact Assessment reported that the number of poor people in the district reduced from 54.4 per cent in 2008 to 37.1 per cent in 2016. Furthermore, land ownership and security were improved resulting in 94.2 per cent of farmers owning land and 92.2 per cent of households having their land registered.

22. IFAD can also build on the strengths and lesson learned from the ongoing Project for Rural Income through Exports (PRICE), Post-harvest and Agribusiness Support Project (PASP) and Rwanda Dairy Development Project (RDDP). RDDP has a significant emphasis on engaging with policy makers and other relevant stakeholders as well as assisting the government with the design and implementation of specific regulatory policies related to the dairy value chain. In line with government requests, IFAD will ensure that KIIWP incorporates relevant good practices promoted in the country programme portfolio.

An innovative phasing approach

23. **KIIWP will be implemented along two phases that are meant to facilitate an early project start up and respond to the urgent demand of the GoR to tackle drought-related issues in the Eastern Province within the shortest possible time.** KIIWP 1 will thus be devoted to the necessary preparatory works, ahead of the large irrigation infrastructure activities and farm business development support that will take place during KIIWP 2, once the Feasibility Studies (FS) and Environmental and Social Impact Assessments (ESIAs) are completed and the irrigation schemes validated. This phasing approach will facilitate: a) early project start up; and b) flexibility in project design and agility in implementation. It is anticipated that with completed FS and disclosed and approved ESIAs, other development partners and the private sector will be more willing to co-finance with communities, the GoR and IFAD.

24. **KIIWP 1** will comprise two components:

Strengthening resilience to droughts: this component will invest in catchment rehabilitation, livestock and domestic water infrastructure development, and the establishment of efficient infrastructure management institutions. Specific Environmental and Social Management Plans (ESMPs) for these activities will be prepared during implementation, as the location of the sites are identified, prepared and implemented. Feasibility studies and ESIAs will be undertaken for four potential irrigation schemes in the District. In addition, 5,000 hectares of area will be studied to prepare a pipeline of investment-ready irrigation schemes in case the pre-identified schemes fall short of the target area for development.

Institutional development and project coordination: this component will provide the institutional, managerial and administrative support services needed to implement the above technical component. Key interventions include: (i) the capacity building of KIIWP implementation staff under the SPIU at the local and national level; and (ii) gender and youth mainstreaming. Opportunities to support development and implementation of relevant national policies, strategies and/or regulations will be prioritized.

25. KIIWP 1 will revolve around (i) the catchment rehabilitation and protection of areas where rainfed agriculture is practised; (ii) the provision of water for livestock and domestic purposes in the most drought-prone sectors of Kayonza; (iii) the preparation of the FS and ESIAs for large irrigation schemes; and (iv) the formation and capacity building of sub-catchment committees, Water for Livestock User Organisations (WLUOs), district and scheme committees. All of these activities will efficiently pave the way for smooth and fast rolling out of the main investments foreseen in KIIWP 2.

26. The two phases will be subject to distinct IFAD Executive Board approval and financing processes, and the activities expected to take place in KIIWP 2 will be fine-tuned based on the results of the FS and ESIAs to be produced and disclosed in accordance with the national environmental regulations and SECAP guidelines. Feasibility studies and ESIAs are expected to be ready by December 2020. This will allow to further shape and finalize the design of KIIWP 2. Out of a total project duration of six years, KIIWP 1 is expected to last 2.5 years and KIIWP 2 will cover the remaining 3.5 years. Some activities initiated in KIIWP 1, like the capacity building of district & scheme committees, sub-catchment committees and WLUOs might be continued based on their status and strength assessed towards the end of KIIWP 1.

27. The anticipated components and activities in KIIWP 2 comprise:

- ***Strengthening resilience to droughts***: climate smart agriculture for irrigated and rain-fed lands will be promoted through Farmer Field Schools. It will include investment on water harvesting and storage, irrigation infrastructure development and marshland development. This component will also include the promotion of good nutritional practices and the Gender Action Learning System (GALS).
- ***Support to farm business development***: farmers will be assisted to take advantage of the investments made under the component on strengthening resilience to droughts by enhancing their organizational and entrepreneurial skills and improving their linkages to access input, service and output markets.
- ***Institutional development and project coordination***: this component will continue supporting the project as described under KIIWP 1.

28. The main expected outcomes at the end of KIIWP 1 and KIIWP 2 combined include: (i) improved access to land, forests, water and water bodies for production purposes; (ii) increased acreage of farmland under water-related infrastructure; (iii) increased acreage of farmland under climate resilient management and practices; (iv) increased capacity of smallholder farmers and local government to sustainably manage natural resources and climate-related risks; (v) enhanced use by farmers, including youth, of technologies, equipment and infrastructure adapted to smallholder agriculture and (vi) increased economic benefits by farmers from market participation and increased sales.

Lessons learned

29. The country loan portfolio provides various lessons learned for the design of KIIWP 1:

a. The focus on a single district enabled the active role of local government staff at different administrative levels (Cell, Sector, District) who were seconded to all project components and activities. KIIWP will follow this example right from KIIWP 1 by supporting local government capacity and institutional strengthening to further ensure the sustainability of the interventions foreseen in Kayonza District.

b. KWAMP showed that a critical element to ensure the sustainability of watershed management is the integrated and participative approach used to prepare, implement and monitor catchment management plans. With the strengthening of irrigation water user organizations (WUOs) and other decentralised structures, this participative approach ensured community ownership and the transfer of infrastructure management to irrigation water user organizations (IWUOs).

c. Early formation, capacity building and empowerment of WUOs paved the way for them to take-over responsibility for Operation and Maintenance (O&M) of irrigation schemes. This process needs to be a scheme-based coaching approach and start early, ideally at the time of planning and construction of a scheme. The same principle will apply to KIIWP 1 for the formation and strengthening of WLUOs.

d. There is a need to engage technically competent service providers (SPs) in the elaboration of technical designs of the irrigation infrastructures. KWAMP experienced cost variations for hillside irrigation infrastructure mainly due to underestimated foundation depth during design, and inadequate water for one dam as a result of poor runoff estimates at design. KIIWP 1 will thus devote the necessary time and budgets to undertake highly professional FS that will guide the design of quality irrigation infrastructure.

e. In order to promote gender equality and youth engagement in agriculture, strategic partnerships and innovative approaches are key. The Rwanda Youth Agribusiness Forum (RYAF) is a relevant partner to engage youth in agriculture, as service providers as well as beneficiaries of capacity building, business and financial services. The GALS has been widely used in IFAD projects in Rwanda to increase equal access to economic opportunities, decision-making processes and share of workload.

f. The competitively-staffed Single Project Implementation Unit (SPIU), in charge of the implementation of all IFAD funded projects, provides a solid foundation for quick implementation start-up and timely disbursements. KIIWP will use the same implementation arrangements in its two phases.

30. Additional lessons learned relevant to KIIWP 2 are included in annex 12.

2. Project description

Project objectives, geographic area of intervention and target groups

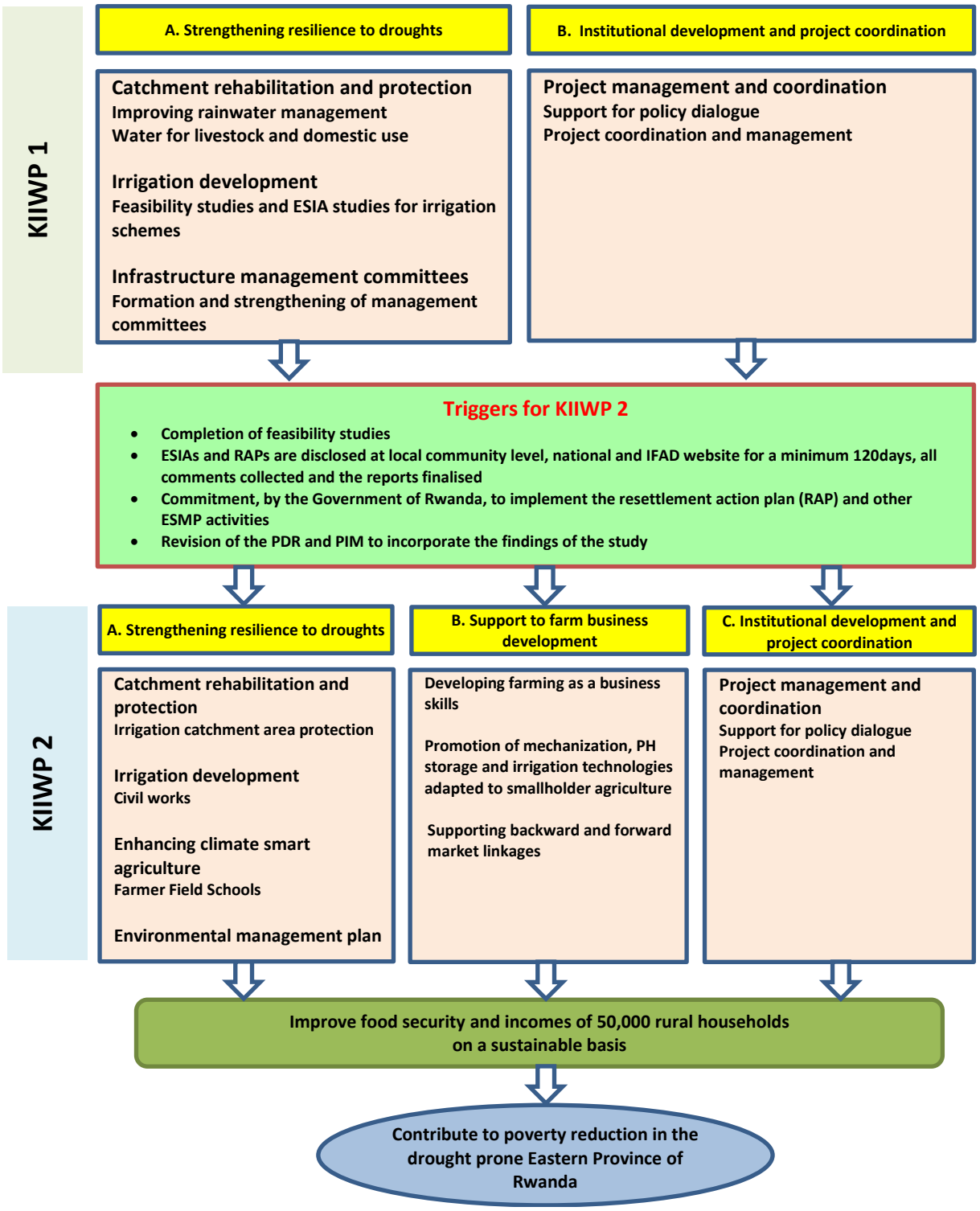
31. The overall KIIWP's Development Goal is to "Contribute to poverty reduction in the drought prone Eastern Province of Rwanda". The Development Objective is to "Improve food security and incomes of 50,000 rural households on a sustainable basis and build their climate resilience". KIIWP will improve the resilience of smallholder farmers to droughts and effects of climate change through increased levels of production and productivity of selected food and cash crops, livestock and improved market access and business development. Through KIIWP, it is expected that smallholder farmers will see an improvement in household food and nutrition security, income, and asset ownership, particularly amongst vulnerable groups including women-headed households and youth. KIIWP's goal will be achieved through the development of sustainable, profitable and intensive small-scale agricultural activities

supported through Public Private Producers Partnerships (4Ps) whenever opportunities exist in the selected project sites and areas.

32. KIIWP will support commodities central to the main livelihoods of the farmers in Kayonza District and for both provision of staple food and income generation. Paddy, maize, potatoes, soya, as well as horticulture are anticipated to be KIIWP major crops.

33. The main expected outcomes of the project include: (i) improved access to land, forests, water and water bodies for production purposes; (ii) increased acreage of farmland under water-related infrastructure; (iii) increased acreage of farmland under climate resilient management and practices; (iv) increased capacity of smallholder farmers and local government to sustainably manage natural resources and climate-related risks; (v) enhanced use by farmers, including youth, of technologies, equipment and infrastructure adapted to smallholder agriculture and (vi) increased farmers' economic benefits from market participation and increased sales. Figure 1 below summarises the two phases foreseen for the project.

Figure 1: KIIWP 1 and KIIWP 2 by component



34. The project will contribute to strategic objectives (SO) 1 and 2 of the draft new Rwanda COSOP 2019-2024. Specifically, across its two phases it will sustainably

increase agricultural productivity in food crop value chains (SO1) and strengthen market linkages between farmers and other value chain actors (SO2). In this regard, KIIWP 1 and KIIWP 2 will also contribute to the SOs in IFAD's Strategic Framework (2016-2025) to increase rural people's productive capacities, increase their benefits from market participation and strengthen the environmental sustainability and climate resilience of their livelihoods. Annex 11 shows the linkages in more detail between the core indicators in KIIWP 1 and KIIWP 2, the IFAD Strategic Framework (2016-2025) and the SDG targets.

35. **Project area.** The targeted project area comprises the eight drought-prone sectors of the District of Kayonza in the Eastern Province of Rwanda (see table 1 below). These areas are relatively hot, with limited rainfall compared to the rest of the country, averaging 900 mm per year, but they have good potential for irrigation. Kayonza District in particular has a high potential for irrigation development estimated at 30,000 hectares. The possible sources of water in the district are lakes (45.3 per cent), marshlands (26.6 per cent), groundwater (21 per cent) and small rivers (7.1 per cent).

36. According to District population data (2016 census), Kayonza District has a population of 392,676 with 26.4 per cent of the population living below the poverty line, and 9.5 per cent living in extreme poverty. About 80 per cent of the total active population is engaged in agriculture as their main economic activity and source of income. The landholding per capita of 0.5 hectare per household (HH) is moderately large compared with the rest of the country. In addition to crop production, livestock is intensified in the district. The main potential economic opportunities of Kayonza District were identified as agri-business development opportunities, land availability, productivity enhancement, mechanization and use of modern farming methodologies.

37. **Target sectors.** Out of a total of 12 sectors in Kayonza, KIIWP 1 and KIIWP 2 will target the eight drought-prone sectors of Gahini, Kabare, Kabarondo, Murama, Murundi, Mwiri, Ndego and Rwinkwavu representing a total of 262,967 people, of which 51.5 per cent are women. In these eight sectors, 58 per cent of all households raise some type of livestock, including 24 per cent with cows. They face a serious challenge of water scarcity during nearly all dry months of the year.

Table 2: Target sectors in Kayonza District

8 drought prone SECTORS	# of HHs (2016)	POPULA-TION (2016)	% of FHHs	HHs with domestic animals	% of HHs with cows	Number of cows
GAHINI	8319	38940	31%	3849	17%	2303
KABARE	9135	39784	25%	5094	36%	8507
KABARONDO	7450	33243	32%	5052	19%	3653
MURAMA	5155	22105	48%	2951	15%	2969
MURUNDI	9057	43386	31%	4064	33%	7225
MWIRI	6289	29569	33%	2675	23%	3283
NDEGO	5422	23526	30%	6883	20%	4830
RWINKWAVU	7399	32414	25%	2956	26%	4282
TOTAL	**58226**	**262967**		**33524**		**37052**
Percentage			**31%**		24%	

Source: National Institute of Statistics of Rwanda (2016)

38. **Target group.** Based on the national wealth ranking system (*Ubudehe*), and consistent with the targeting strategy laid out in the COSOP, KIIWP's direct target

groups will comprise about 50,000 poor and food insecure rural households [8], equivalent to 225,000 people who are in the following *Ubudehe* categories: Category 1: Families who do not own a house or cannot pay a rent, have a poor diet and can hardly afford basic household tools and clothes; Category 2: Those who have a dwelling of their own or are able to rent one, mostly get food and wages[9] from working for others but rarely get full time jobs; and Category 3: Those who have a job and farmers who go beyond subsistence farming to produce a surplus which can be sold.[10] Out of the 50,000 households targeted by KIIWP 1 and KIIWP 2, 7,167 households equivalent to about 32,250 persons are expected to benefit from KIIWP 1.

39. **Profile of target groups.** It is worth noting that in the eight KIIWP target sectors, almost all households (58,209 HH = 99.97 per cent) are categorised as Category 1, 2 or 3. Almost half of them (49 per cent) are actually categorised as Category 1 and 2, which is higher than in the whole of Kayonza District (47 per cent) and also higher than the national average (43.9 per cent). Female-headed households are 31 per cent. Most of the target households will be men, women and youth farmers and livestock keepers, and those in wage labour and off-farm activities along the target value chains.

40. **Targeting strategy.** The targeting strategy for KIIWP 1 and KIIWP 2 will be based on the following targeting mechanisms:

    a. Geographical targeting. As mentioned above, the project will focus on the eight drought-prone sectors of Kayonza District. The selection of specific sites will be based on the level of degradation, topography and water availability and viability of the site for development.

    b. Self-targeting. The goods and services provided by the project will respond to the priorities, financial/labour capacities and livelihood strategies of the target groups

    c. Direct targeting. The poorest households, young farm workers and women (from Category 1) will be targeted directly by the project, involving the *Umudugudu* committee at village level to ensure transparent and participative methods of household selection, for example for labour for construction activities. The Social Management Plan in the ESIAS will specifically assess the need and how to reach out to Category 1 households in irrigation development. The approach used in KWAMP of redistributing 20 per cent of the land that was owned by the District to the landless will be explored. Category 1 households are also expected to benefit from the seasonal and permanent job opportunities created through market-orientated irrigation development. Women and youth will be specifically targeted to account for at least 50 per cent and 30 per cent of beneficiaries, respectively. Youth will be targeted as both beneficiaries and service providers. Women-headed households are also expected to represent 30 per cent of households reached. Youth will be targeted as both beneficiaries and service providers. It is also expected that the management committees will comprise 40 per cent women and 25 per cent youth.

41. Empowering measures. The training of management committees will increase awareness of gender issues in infrastructure management, as well as the role of youth. The GALS will be used to improve equal access of men and women to economic opportunities, decision-making processes and share of workload. Young professional organisations, such as the Rwanda Youth in Agribusiness Forum (RYAF) and the

[8] Comprising 28,000 households that benefit directly and 22,000 households that benefit indirectly.

[9] Rwanda's average daily wages range from RWF 750-1200 (USD 0.87-1.40) in the agricultural sector to RWF 1,500-5,000 (USD1.75-5.85) in the construction sector.

[10] The fourth category (not targeted by KIIWP) includes people who earn high incomes; people who own houses; people who can afford a luxurious lifestyle.

Horticulture in Reality Cooperative (HoReCo) are mainly composed of young graduates in Agriculture, Animal Production, Irrigation, Food Dairy technologies and Agricultural Mechanisation. RYAF and HoReCo have recently signed MoUs with MINAGRI to encourage the involvement of young professionals in implementing programs/projects that support agricultural transformation. These youth will be particularly targeted as service providers to provide technical and managerial assistance to management committees.

42. Procedural measures. Attention will be given to costs/beneficiary contributions, timing and administrative procedures required for effective participation of the various target groups. To ensure the participation of women, attention to the location and timing of various project activities may increase their opportunity to participate.

43. Operational measures and monitoring. A Gender, Targeting and Community Mobilisation Officer has been appointed in the MINAGRI SPIU to coordinate the implementation of the gender and targeting strategies. In addition, KIIWP project staff will include an M&E Officer that is also in charge of gender and youth.

44. Further details on gender and youth mainstreaming and the targeting and gender strategies are available in the description of components and in the Project Implementation Manual.

45. **This PDR mainly focuses on the proposed activities and implementation arrangements for KIIWP 1, while also presenting the overall project rationale and strategy (KIIWP 1 and KIIWP 2).**

Components/outcomes and activities[11]

46. **KIIWP 1 will consist of two components: A) strengthening resilience to droughts and B) institutional development and project coordination.** The main expected outcomes and outputs can be summarized as follows: i) 11,250 people reporting improved access to land and water for production purposes; (ii) 1,400 hectares of land brought under climate resilient management benefitting 21,000 people; (iii) 35 infrastructure (valley tanks and boreholes) constructed in rain-fed areas; (iv) Investment-ready schemes for the irrigation of 2,275 hectares combined with an investment-ready pipeline of about 5,000 hectares; (v) 49 groups supported to sustainably manage natural resources and climate-related risks and (vi) Contribution to the development and/or operationalization of relevant national policies.

Component A: Strengthening resilience to droughts

47. For KIIWP 1, this component will cover the much needed catchment rehabilitation and protection in rainfed areas; the urgently required infrastructure for livestock and domestic purposes; and all preparatory activities for the irrigation development to be done under KIIWP 2.

Sub-component A.1: Catchment Rehabilitation and Protection

48. This sub-component will support investments in catchment rehabilitation through the following investments: a) sub-catchment planning; b) land husbandry in rainfed areas; and c) construction of boreholes and valley tanks to supply water for livestock and domestic use. Specific ESIAs and ESMPs will be developed for each interventions under this subcomponent.

49. **Improving rain water management:** Farmland protection and rehabilitation techniques will be selected with a view to reducing runoff so that rainwater can

[11] Additional details on KIIWP 1 activities are provided in Annex 8 (Project Implementation Manual PIM).

infiltrate into the soil. This will be combined with land husbandry practices geared towards increasing vegetative cover in the farms which will increase the soil fertility. The protection activities such as construction of check dams, side drains, terraces and contour buns will be complimented with agro-forestry activities including planting of selected agro-forestry trees, shrubs and grasses as well as pastures rehabilitation. A target of 1,400 hectares will be protected and rehabilitated in Murundi, Murama, Mwiri, Kabarondo and Gahini Sectors.

50. The farmlands will be selected through participatory assessments in the sub-catchments. An output of the assessments will be the catchment management plans that will guide the implementation of the activities. The plans will identify the zones in most need of protection and the action to be taken to rehabilitate and protect them.

51. When the catchment management plans are developed, the SPIU will engage a service provider(s) to manage the implementation of the plans at sub-catchment level. The SPIU will have a field officer responsible for supervising the implementation jointly with the district and the sub-catchment committees (SCCs) and with the active participation of WUOs and WLUOs. The activities are expected to result in the rehabilitation and protection of 5,950 hectares of farmlands.

52. **Water supply for livestock and domestic use:** The supply of water for livestock and domestic purposes will be improved through the development of valley tanks and boreholes. The selection of where to invest in livestock watering facilities will be informed by the need to evenly spread the grazing areas across the sectors to minimize overgrazing. The project will develop 20 boreholes and 15 valley tanks to supply water to 2,500 households and 7,200 livestock.

Sub-component A.2: Irrigation Development

13

53. **Feasibility Studies (FS) and ESIA for Irrigation Schemes** will be undertaken for four potential irrigation schemes in Kayonza District, namely:

    a. Ndego Sector Irrigation Scheme (Kibare (400 hectares), Humure (600 hectares) and Byimana (400 hectares) with a potential net area of 1,400 hectares to be irrigated. The scheme will benefit about 4,667 households. The potential water source will be Lake Nasho on the Akagera River, near Akagera National Park. *Note: The Government of Rwanda, supported by DFID, has initiated the FS and ESIA for irrigation schemes in the Ndego Sector.*

    b. Kabare Sector Irrigation Scheme, with a potential net area of 600 hectares to be irrigated at Gakoma. The scheme will benefit about 2,000 households. The water source for the irrigation is the Lake Nasho on the Akagera River.

    c. Kanyeganyenge Dam and Irrigation Scheme with a potential command area of 150 hectares at Kabarondo. The irrigation scheme will benefit about 500 households. A dam will be built on the Kanyeganyenge river to supply water to the irrigation scheme.

    d. Gishanda Dam and Irrigation Scheme with a potential command area of 125 hectares at Kabare, to benefit over 400 households. A dam will be built on the Rwinkwavu River. *Note: The sizes of the reservoirs will be determined during feasibility studies, but it is expected to be above one million m^3 for each dam*.

54. In addition, another area of 5,000 hectares will be studied to prepare a pipeline of investment-ready irrigation schemes. The pipeline will also act as a reserve list of irrigation schemes for development under KIIWP 2, in case the pre-identified schemes

fall short of the target area for development. Priority for the sites to be studied will be given to sites in Kayonza District identified in the Irrigation Master Plan (IMP).

55. Irrigation schemes that are identified to be environmentally, socially, technically and financially viable will be developed under KIIWP. The studies will be done by international consulting companies. The SPIU will engage consultancy firms with the different required expertise to carry out these studies and assessments with active participation of the community institutions. Specific ESMPs for activities under KIIWP 1 will be prepared during implementation as part of the feasibility studies and ESIAs, as the location of the sites are identified and prepared.

Sub-component A.3: Infrastructure management institutions

56. **Formation and strengthening management committees:** In order to ensure long-term sustainability, KIIWP 1 will support the institutional development of management committees that will be responsible for coordinating the planning and implementation of activities in the catchment plans. In addition, the committees will play an active role in the planning, design, construction and operation and maintenance of infrastructure developed in the catchment. The committees will also be central in ensuring inclusive and equitable access to water for all members, including farmers and livestock keepers. The committees will develop drought contingency plans for the catchment and sub-catchment areas. Committees to manage specific infrastructure will be capacitated and strengthened to benefit all users of the infrastructure.

57. An estimated 10 SCCs, 35 WLUOs and four scheme steering committees will be formed and/or strengthened during KIIWP 1, totalling 49 management committees. KIIWP 1 will support the formation and strengthening of these institutions in the eight drought-prone sectors of the District, based on one consistent approach. District, Sector and cell level staff, with the support of WUO Specialist from the SPIU and RAB, will support the formation and strengthening of these institutions. The District could simultaneously replicate the approach in the remaining four Kayonza sectors, using their own resources.

58. Capacity building will take place, covering three key areas: (i) governance; (ii) technical water management (O&M); and (iii) monitoring and exchange of experiences. The capacity building will be based on a participatory Farmer Field School approach. Some key features of the institutions are presented below.

59. *Scheme and District Steering Committees***.** As per Ministerial Instructions (2017, Draft[12]), the project will support the establishment and strengthening of Scheme and District-level Steering Committees to support and oversee the functioning of the WUOs and ensure optimal use of developed land at irrigation scheme and District level. Overall six irrigation schemes are expected to be constructed in Kayonza, and four schemes Steering Committees will need to be established. These will be chaired by the Executive Secretary of the Sector in which the scheme is located.

60. *Sub-Catchment management committees***.** In line with the national policy, KIIWP 1 will support the setting-up and strengthening of sub-catchment [13] management committees in each watershed. These committees will put in place regulations on use, conservation, protection and management of water resources. They are expected to be effective institutional bodies for managing and improving sub-catchment areas, and to perform a central role in the planning and implementation of activities identified in the sub-catchment plans, together with the Scheme and District Steering Committees.

[12] Draft Ministerial Instructions on Land Development, Conservation and Exploitation of Developed Land.

[13] A catchment is defined as an area from which rainwater flows into a watercourse or infiltrates into a groundwater body.

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61. KIIWP 1 will start with establishing the exact boundaries of the different catchments and sub-catchments in Kayonza District through Geographic Information System (GIS) mapping. This will be done by a local service provider. KIIWP 1 will support the preparation of sub-catchment management plans, involving the sub-catchment committees in order to ensure water resources protection and conservation by all in an integrated approach. These sub-catchment committees will also be responsible for safeguarding communal areas with soil and water conservation measures such as terraces and agro-forestry and monitor the implementation of reforestation and safeguard the newly reforested areas.

62. *Water for Livestock Users Organisations* will be established, and existing ones strengthened, to ensure the management and sustainability of boreholes and valley tanks. Currently there are 15 valley tanks for domestic and livestock use, with each one serving an average of 89 male and 15 female headed households and 480 livestock. A further 15 new valley tanks will be constructed. In addition, 20 boreholes will be installed. In total, 15 existing WLUOs will be strengthened and 35 new WLUOs will be established and strengthened. The WLUOs will prepare guidelines for O&M of the boreholes and valley tanks, including connected domestic water supply systems. Women's participation in the management of water supply infrastructure will be mandatory. The participation of youth will also be encouraged, as they can be hired as water point managers, collect water fees and ensure hygienic conditions at the water points.

Sub-component A.4: Implementation of Environmental and Social Management Plans

63. Under this subcomponent, environmental and social management plans as identified by the ESIAs will be implemented. Specific provisional budget has been provided for as indicated in the ESMF.

Component B: Institutional development and project coordination

64. This component is designed to strengthen government agencies to deliver project outputs and to support policy dialogue and institutional development that will sustain project interventions beyond project completion.

Sub-component B.1: Support to policy dialogue and enabling institutional environment

65. KIIWP 1 will strengthen institutions that can directly or indirectly support the implementation and provide policy supports that are needed for the effective implementation of the project. Key activities and interventions foreseen under this sub-component include the below activities.

66. **Capacity building interventions** will be identified for KIIWP staff under the SPIU, including RAB and district personnel engaged in KIIWP 1 implementation. These capacity building activities will be preceded by a needs assessment. The financing of these activities will be done by the concerned entities and co-financed by the project, provided that these capacity building activities are benefiting project implementation and build the sustainability prospects of the project. Collaboration with the Rwanda Capacity Development and Employment Services Board (CESB) will be explored.

67. **Gender and youth mainstreaming.** Poverty and gender and youth studies will be conducted at baseline and in the third year. Initial studies will be used by RAB in connection with the SPIU to strengthen the targeting strategy and prepare a brief gender and youth action plan for KIIWP 1. This will also pull on work already done by MINAGRI and other IFAD-supported projects. Specific training will be organised to

familiarise government and project staff with gender and youth mainstreaming approaches, and special provisions will be made to ensure that gender equity concerns are adopted in the implementation of all project components. The M&E system will disaggregate data by sex and age to support gender and youth analysis.

68. **Support for policy dialogue** will be provided through an evaluation of implementation and impact of new or existing policies related to the project activities with relevant national, and district level stakeholders. Support for water management policies will be through the implementation of the recently enacted policies and legislation including Ministerial Instructions on Land Development, Conservation and Exploitation of Developed Land for the formation and registration of WLUOs and district and steering committees. In addition, via multi-stakeholder platforms and fora of dialogue, KIIWP 1 will strive to raise specific policy discussion points meant to address identified bottlenecks in Rwanda's agricultural sector, such as:

a. Support to national policy on contract farming, making use of the tools developed through the implementation of the Legal Guide on Contract Farming[14] developed by UNIDROIT, FAO and IFAD in 2015;

b. Support to law on financial lease for agricultural equipment (e.g. "special registry" requirement in the law that is yet to be effective);

c. Discussion on Value Added Tax (VAT) in rice processing that makes Rwandan rice less competitive with regional products;

d. Current issues of availability and quality of seeds, including multiplication.

Sub-component B.2: Project management and coordination

69. The objective of this sub-component is to provide the coordination arrangements, including the financial and human resources that are needed for the implementation of the project. Details on coordination arrangements are provided in Section 4 of this PDR.

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Conditions to start KIIWP 2

70. In order to proceed from KIIWP 1 to KIIWP 2, specific, transparent and monitorable triggers are set as conditions. See annex 15 for more details.

a) FSs identify irrigation schemes that are financially, economically, environmentally and socially viable and sustainable.

b) Third party satisfactory review of FSs, ESIAs and Resettlement Action Plans (RAPs).

c) ESIAs and RAPs are disclosed at local community level, national and IFAD website for a minimum 120 days.

d) Provision of a budget and commitment by the Government of Rwanda to implement the RAP and other ESMP activities identified by the ESIAs.

e) Revision of the PDR and PIM to incorporate the findings of KIIWP 1.

71. Before submitting KIIWP 2 for EB approval, IFAD Senior Management will assess if conditions have been fully met.

[14] Source: https://www.unidroit.org/english/guides/2015contractfarming/cf-guide-2015-e.pdf.

Summary of activities under KIIWP 2

72. Building up on KIIIWP 1, KIIWP 2 will continue to focus on strengthening resilience to droughts as the first component (Component A). Potential irrigation development will comprise the Ndego Irrigation Scheme (net 1,400 hectares), Kibare Irrigation Scheme (net 600 hectares), Kanyeganyege Irrigation Scheme (net 150 hectares + dam), and Gishynda Irrigation Scheme (net 125 hectares + dam). Depending on the findings from KIIWP 1 FS, other irrigation schemes will be developed in place of the above, if they are found to be unviable. KIIWP 2 will have two additional components: (B) Support to farm business development and (C) Institutional development and project coordination. Activities in Component B will include assisting farmers engaged in commercial production, promoting mechanization, post-harvest storage and irrigation technologies, and supporting backward and forward market linkages. Component C will focus on supporting national policy related to project activities, mainstreaming gender and youth, and capacity building, in addition to project management and coordination. More information on the anticipated activities in KIIWP 2 are provided in Annex 12.

Theory of Change[15]

73. KIIWP 1 Theory of Change (TOC) is based on the situation faced by crop and livestock farmers currently living in the target area. Given the identified problems of:

    1. climate change (droughts);
    2. population pressure;
    3. limited water storage and availability;
    4. crop failures in subsistence agriculture;
    5. limited number of investment-ready irrigation projects;
    6. inadequate farmer participation in rural development planning; and
    7. weak technical and organizational capacity of district staff.

74. These factors inevitably lead to catchment degradation, conflicts between water users, death of livestock, need for emergency food, reduced investment in irrigation, weak sense of responsibility/ownership of natural resources and no harmonized approach to support project implementation.

75. KIIWP 1 TOC entails that smallholder farmers will sustainably increase their food security and income through focused interventions made at district/sector level. These interventions will revolve around four main pillars: (i) catchment rehabilitation through land husbandry in rainfed areas; (ii) construction of valley tanks, boreholes and rainwater harvesting ponds; (iii) preparation of pipeline of investment-ready projects from 7,275 hectares and (iv) formation and strengthening of sub-catchment committees, WLUOs, scheme and district steering committees.

76. The ownership of direct and indirect beneficiaries will be sought through their development as strong local organisations able to sustainably manage the infrastructure supported by the project. This, combined with the integrated watershed management approach adopted by the project, will ensure appropriate management of natural resources and increased control of climate-related risks in the target areas. The direct result of KIIWP 1 interventions can be summarized as follows:

    a. 1,200 hectares catchment area protected and rehabilitated in four sectors (Kabarondo, Murundi, Gahini and Murama);

[15] See diagram in annex 2.

b. 200 hectares (667 households) benefitting from rainwater harvesting ponds;

c. 20 boreholes and 15 valley tanks supplying water to 2,500 households and 7,200 livestock;

d. Six schemes ready to be built for the irrigation of 2,275 hectares + investment-ready pipeline;

e. 49 committees formed and capacitated to manage efficiently the catchment areas and water rights for livestock and domestic purposes

Alignment, ownership and partnerships

Alignment with national priorities

77. KIIWP's Development Goal is fully aligned with GoR's *second Economic Development and Poverty Reduction Strategy* (EDPRS 2) whose overarching goal is growth acceleration and poverty reduction[16]. More specifically, KIIWP is well aligned with Rwanda's *Strategic Plan for the Transformation of Agriculture* (PSTA 4), the Government's flagship investment programme for the agriculture sector:

a) The enhanced CSA and LH practices promoted under Component A respond well to the first two Priority Areas (PAs):

- PA 1: Innovation and extension provide the knowledge base for PAs 2-3. The focus is on improving agronomic knowledge and technology in terms of basic research and innovation, development of efficient extension services, as well as promoting knowledge and skills of value chain actors.
- PA 2: Productivity and resilience focus on promoting sustainable and resilient production systems for crops and animal resources.

b) While the support to farm business development foreseen in Component B is well aligned with the third PA:

- PA 3: Inclusive markets and value addition seek to improve markets and linkages between production and processing. This includes key input markets such as fertilisers, insurance and finance as well as upstream activities such as aggregation, promotion of value addition, market infrastructure and export readiness.

c) And the support for policy dialogue under Component C aligns with the fourth PA:

- PA 4: Enabling environment and responsive institutions provide the regulatory framework and define and coordinate public sector involvement.

78. As for KIIWP's specific interventions on irrigation infrastructure, they are well aligned with the *National Strategy on Climate Change and Low-Carbon Development* (NCCLCD) for Green Growth and Climate Resilience that underlines the need to manage the implications of climate variability for the social, environmental and economic development of the country.

79. Last but not least, KIIWP meets the objectives of the *Nationally Determined Contributions* (NDCs) that are built upon the NCCLCD and advocate for a climate resilient economy. The NDC's framework states clearly that the development of irrigation infrastructure and other water efficient technologies will contribute to both sustainable intensification of agriculture and integrated water resources management

[16] The EDPRS 2 aims to raise GDP per capita to USD 1,000; reduce the percentage of the population living below the poverty line to less than 30%; and reduce the percentage of the population living in extreme poverty to less than 9%.

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and planning, which are the pillar for enhancing food security and biodiversity and ecosystem conservation and preservation.

Alignment with SDGs and IFAD corporate priorities

80. Overall, KIIWP will directly contribute to the attainment of several Sustainable Development Goals, notably SDG 1 (No Poverty, Targets 4 and 5); SDG 2 (Zero Hunger, Targets 3 and 4); SDG 5 (Gender Equality, Target 5); SDG 8 (Decent Work and Economic Growth, Target 3); SDG 9 (Industry, Innovation and Infrastructure, Targets 1 and 3); SDG 13 (Climate Action, Target 1) and SDG 15 (Life on Land, Target 3). See Annex 11 for more details.

81. KIIWP is also well aligned with IFAD mainstreaming priorities and policies on youth, gender, climate/environment, private sector, rural finance and nutrition.

Table 3: Alignment with IFAD Policies, Strategies and Action Plans

Policy/Strategy /Action Plan	Alignment
Country level policy engagement	The project will strive to create and provide spaces for policy strengthening, formulation and implementation, led by the government and including multiple actors in the various value chains involved, particularly paddy, maize and horticulture. Particular emphasis in KIIWP 1 will be put on the formalization of the participatory approach used to foster irrigation development through integrated catchment management plans, and setting up a legal framework for contract farming expected to be encouraged in some of the new irrigation schemes.
Targeting policy	The KIIWP targeting strategy is based on inclusiveness and will include very poor, poor and resourceful poor households as direct beneficiaries. The project will adopt several targeting mechanisms: geographic, direct and self-targeting, enabling environment, as well as ensuring procedural and operational measures. The strategy will be assessed at various stages of the project life to readjust or reinforce whenever it is needed.
Gender equality and women's empowerment policy	KIIWP will mainstream gender concerns through project activities. KIIWP 2 will integrate the GALS in the FFSs approach. This will promote equitable: (i) participation and share of benefits for women and men involved in crop production (ii) decision-making capacities at household and group levels and (iii) share of workloads between men and women in agricultural and domestic activities. In addition, KIIWP will foster economic empowerment of women in the off-farm economy.
Mainstreaming nutrition action plan	KIIWP will promote good nutrition practices in rural households, particularly among the most vulnerable. Nutrition education, including on local foods and dietary diversification, will be integrated into FFS training. Efforts to increase horticultural production will also support access to a diversified diet and nutrient rich food. Operational measures to implement these activities will involve a short-term TA to develop a training module and liaising with the Nutrition Specialist in RDDP. In addition, the project log frame will facilitate the monitoring of nutrition related outputs (number of persons provided with targeted support to improve their nutrition) and impact (number of children 0-5 years suffering from malnutrition).
Rural Youth Action Plan	KIIWP mainstreams youth in operations to enable the social and economic empowerment of young rural women and men. Youth-sensitive programming includes: the 25 per cent quota on youth outreach; age-disaggregated data in the M&E system to support youth assessments and analyses; and, the targeting of

Policy/Strategy /Action Plan	Alignment
	youths throughout project activities. Youths will be specifically targeted as service providers through the young graduate programme initiated by MINAGRI to provide technical and managerial assistance to farmers' cooperatives, WUOs and WLUOs. Youths who cannot access much land and are interested in quick wins are also likely to be attracted to horticultural development activities.
Rural finance policy	KIIWP foresees that bankable business plans developed by cooperatives, off-takers and processors will receive technical support in order to facilitate access to financial products. Particular emphasis will be given to strengthening the linkages between smallholder farmers and the cooperatives or companies that have already received co-financing support from PASP to develop storage, processing or transport facilities in Kayonza. For new investments that may occur after PASP completion, or for other VCs that are not supported by PASP in Kayonza District (*esp.* rice), KIIWP will provide grant support using modalities similar to PASP project, e.g. (i) Grants for business-driven cooperative development plans, to establish new drying grounds and/or simple, affordable post-harvest storage facilities using renewable energy; (ii) Performance-based grants (tied to a loan) under 4Ps joint-venture for the new warehouses that would be requested as the result of new irrigation schemes (esp. in Ndego sector). The project will not work directly on policies related to rural finance.
Access to land and land security	KIIWP will mainly work on production intensification and access to natural resources (especially water). As the project will also work on land tenure security, the guiding principles of IFAD's land policy suggest that IFAD should be aligned to national policy priorities, do no harm, focus on gender dimensions of land usage and empower rural people and their organizations on land tenure.
IFAD environment and natural resource management policy and climate change strategy[17]	Aligned with the ENRM policy (2011), particularly with principle 3-promote climate-smart approaches to rural development and principle 4-greater attention to risk and resilience to manage shocks. The climate change strategy (2010) suggests that climate change should be factored into the project design, explore new ways to work on emerging problems and mobilize resources to address these problems. The Integrated catchment Management Plans and impending results of the ESIAs prepared under KIIWP 1 will help to ensure that irrigation investments are socially and environmentally sustainable.
Knowledge management	The project will use new guidance on best practice for logical frameworks and results hierarchies, and will have a dedicated M&E system as well as significant budget for knowledge management related to policy experience.
Scaling up	The project is consistent with IFAD's vision of scaling up, defined as "expanding, adapting and supporting successful policies, programmes and knowledge, so that they can leverage resources and partners to deliver larger results for a greater number of rural poor in a sustainable way". KIIWP 1 intends to utilize the extensive set of lessons learned from past and ongoing IFAD-funded programmes to ensure that the project interventions provide continuity while growing in scale.

[17] IFAD recently revised the environmental and climate change strategy, which KWIIP is also aligned to as it builds on the earlier NRM policy and Climate change strategy. .

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Harmonization and partnerships

82. IFAD experience with FAO[18] and the International Water Management Institute (IWMI), in supporting investments in Agricultural Water Management (AWM) has informed the design of KIIWP and will be instrumental to further shape KIIWP 2.

83. The implementation of KIIWP will build on existing programs and activities of other implementing partners or agencies working in the same sector or geographical location. Partners that can collaborate with KIIWP 1 are identified as follows[19]:

a. ***MINAGRI*** will maintain an oversight role and lead the policy interventions and dialogue for the sector in general and for KIIWP implementation in particular. The Permanent Secretary in MINAGRI will maintain the role of Chair within the steering committee of KIIWP.

b. ***IFAD-funded "Climate Resilient Post-Harvest and Agribusiness Support Project" (PASP)*** is implemented in Kayonza for the maize and beans value chains. KIIWP will ensure that the nine cooperatives currently supported by PASP will be reached for catchment rehabilitation activities whenever relevant.

c. ***IFAD-funded Rwanda Dairy Development Program (RDDP)*** is also operational in Kayonza, focusing on developing the dairy value chain through improving cattle productivity, milk quality and processing capacity of the dairy industry. RDDP is also strengthening the policy and institutional framework for the sector. Synergies will be created to supply water for livestock.

d. ***IFAD-funded Project for Rural Income through Exports (PRICE)*** is a country-wide project focusing on the establishment of pro-poor cash crop value chains involving smallholder production and early transformation in partnership with private operators. Under KIIWP, synergies will be established to support horticulture producers established in rain-fed areas.

e. ***Rwanda Capacity Development and Employment Services Board (CESB)*** established under the Law Nº43/2016 of 18/10/2016 is strategically positioned under the Ministry of Public Service and Labour (MIFOTRA). CESB will support the capacity building interventions foreseen under Component C of KIIWP.

Benefits, costs and financing

Project costs of KIIWP 1

84. KIIWP 1 total project investment and recurrent costs, including physical and price contingencies, are estimated at US$20.93 million (RWF 18.7 billion), of which US$20.03 million are baseline costs and US$0.9 million are allowances for physical and price contingencies. The costs broken down by project component are as follows: (i) Strengthening resilience to droughts: US$16.92 million (82 per cent); (ii) Institutional development and project coordination: US$3.1 million (18 per cent).

85. The estimated costs for KIIWP 2, including physical and price contingencies, are estimated at US$59.23 million (RWF 53.16 billion). The foreign exchange component is estimated at US$26.96 million (46 per cent of project cost), while taxes have been calculated at approximately US$8.7 million or 14.7 per cent of total project costs. Total baseline costs are US$55.47 million, while price contingencies account for US$1.9 million (or 3 per cent of the base costs) and physical contingencies amount to US$1.8 million (or 3 per cent of the base costs).

[18] IFAD grant implemented by FAO and IWMI: Opportunities to enhance smallholder agriculture in sub-Saharan Africa Through Sustainable Water, Land and Ecosystem Management

[19] Other partners likely to be involved in the second phase of KIIWP are provided in Annex 13 of this PDR.

Table 4: KIIWP 1 project costs by component

	(RWF Million)			(US$ '000)			% Foreign Exchange	% Total Base Costs
	Local	Foreign	Total	Local	Foreign	Total		
A. Strengthening resilience to droughts								
1. Catchment rehabilitation and protection structures	2,979.7	3,962.9	6,942.6	3,485.0	4,635.0	8,120.0	57	41
2. Irrigation Development	3,454.2	3,454.2	6,908.4	4,040.0	4,040.0	8,080.0	50	40
3. Infrastructure Management Institutions	157.4	69.0	226.4	184.1	80.7	264.8	30	1
4. Enviromental and Social Management Plan	267.6	126.5	394.2	313.0	148.0	461.0	32	2
Subtotal Strengthening resilience to droughts	6,858.9	7,612.7	14,471.6	8,022.1	8,903.7	16,925.8	53	84
B. Institutional Development and Project Coordination								
1. Institutional Support	153.9	38.5	192.3	180.0	45.0	225.0	20	1
2. Programme Management and Coordination	1,580.0	885.9	2,465.9	1,848.0	1,036.1	2,884.1	36	14
Subtotal Institutional Development and Project Coordination	1,733.9	924.4	2,658.2	2,027.9	1,081.1	3,109.0	35	16
Total BASELINE COSTS	8,592.8	8,537.0	17,129.8	10,050.0	9,984.8	20,034.8	50	100
Physical Contingencies	106.9	106.9	213.8	125.0	125.0	250.0	50	1
Price Contingencies	736.7	683.1	1,419.8	338.6	314.6	653.2	48	3
Total PROJECT COSTS	9,436.3	9,327.0	18,763.3	10,513.7	10,424.4	20,938.0	50	105

Table 5: KIIWP 1 project component by year (USD'000)

	Base Cost				
	2019	2020	2021	2022	Total
A. Strengthening resilience to droughts					
1. Catchment rehabilitation and protection structures	2,400.0	4,370.0	1,350.0	-	8,120.0
2. Irrigation Development	1,120.0	3,660.0	3,300.0	-	8,080.0
3. Infrastructure Management Institutions	113.5	81.7	66.2	3.4	264.8
4. Enviromental and Social Management Plan	-	292.0	169.0	-	461.0
Subtotal Strengthening resilience to droughts	3,633.5	8,403.7	4,885.2	3.4	16,925.8
B. Institutional Development and Project Coordination					
1. Institutional Support	41.3	54.9	68.7	60.2	225.0
2. Programme Management and Coordination	1,057.2	632.0	870.3	324.5	2,884.1
Subtotal Institutional Development and Project Coordination	1,098.5	686.9	939.0	384.7	3,109.0
Total BASELINE COSTS	4,732.0	9,090.6	5,824.2	388.1	20,034.8
Physical Contingencies	67.5	115.0	67.5	-	250.0
Price Contingencies					
Inflation					
Local	51.0	309.5	401.5	52.8	814.8
Foreign	25.2	144.2	137.6	7.5	314.6
Subtotal Inflation	76.3	453.6	539.1	60.4	1,129.4
Devaluation	-28.3	-175.6	-239.8	-32.5	-476.2
Subtotal Price Contingencies	48.0	278.0	299.3	27.9	653.2
Total PROJECT COSTS	4,847.5	9,483.6	6,191.0	415.9	20,938.0
Taxes	557.6	871.1	272.6	-	1,701.2
Foreign Exchange	2,547.7	4,917.4	2,846.7	112.6	10,424.4

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Table 6: Expenditure Accounts by Components (USD'000) - totals including contingencies

	Strengthening resilience to droughts			Institutional Development and Project Coordination					
	Catchment rehabilitation and protection structures	Irrigation Development	Infrastructure Management Institutions	Enviromental and Social Management Plan	Institutional Support	Programme Management and Coordination	Total	Physical Contingencies %	Physical Contingencies Amount
I. Investment Costs									
EQUIPMENT & MATERIALS	3,000.0	-	-	-	-	56.0	3,056.0	-	-
GOODS & SERVICES & INPUTS	100.0	-	20.7	36.0	-	200.0	356.7	-	-
WORKS	5,000.0	-	-	-	-	-	5,000.0	5.0	250.0
VEHICLES	-	-	-	-	-	236.4	236.4	-	-
CONSULTANCIES	20.0	8,080.0	89.0	180.0	-	425.0	8,794.0	-	-
TRAINING & WORKSHOPS	-	-	155.1	245.0	225.0	210.6	835.7	-	-
GRANTS & SUBSIDIES	-	-	-	-	-	-	-	-	-
Total Investment Costs	8,120.0	8,080.0	264.8	461.0	225.0	1,128.0	18,278.8	1.4	250.0
II. Recurrent Costs									
SALARIES & ALLOWANCES	-	-	-	-	-	1,514.2	1,514.2	-	-
OPERATING COSTS	-	-	-	-	-	241.9	241.9	-	-
Total Recurrent Costs	-	-	-	-	-	1,756.1	1,756.1	-	-
Total BASELINE COSTS	8,120.0	8,080.0	264.8	461.0	225.0	2,884.1	20,034.8	1.2	250.0
Physical Contingencies	250.0	-	-	-	-	-	250.0	-	-
Price Contingencies									
Inflation									
Local	214.0	368.1	13.5	30.1	20.3	168.8	814.8	-	-
Foreign	129.6	144.7	1.9	5.5	2.0	30.8	314.6	-	-
Subtotal Inflation	343.7	512.8	15.4	35.6	22.3	199.6	1,129.4	-	-
Devaluation	-111.5	-223.4	-8.2	-18.2	-12.4	-102.4	-476.2	-	-
Subtotal Price Contingencies	232.1	289.4	7.2	17.4	9.9	97.2	653.2	1.2	7.6
Total PROJECT COSTS	8,602.1	8,369.4	272.0	478.4	234.8	2,981.3	20,938.0	1.2	257.6
Taxes	1,603.0	-	3.2	5.6	-	89.4	1,701.2	2.7	46.4
Foreign Exchange	4,889.6	4,184.7	82.6	153.5	47.0	1,067.0	10,424.4	1.2	128.8

KIIWP 1 project financing, co-financing strategy and plan

86. KIIWP I will be financed by: (i) IFAD up to US$17.79 million (85 per cent), through a highly concessional loan; (ii) Government of Rwanda for a total of US$2.83 million (13.5 per cent) in the form of tax exemptions and consultancies for Ndego irrigation system; (iii) DFID for a total of US$0.3 million (1.5 per cent) in the form of consultancies for Ndego irrigation system.

Table 7: KIIWP 1 project costs and financing by component (USD'000)

	IFAD		The Government		DFID		Total	
	Amount	%	Amount	%	Amount	%	Amount	%
A. Strengthening resilience to droughts								
1. Catchment rehabilitation and protection structures	6,999.1	81.4	1,603.0	18.6	-	-	8,602.1	41.1
2. Irrigation Development	6,929.1	82.8	1,131.2	13.5	309.1	3.7	8,369.4	40.0
3. Infrastructure Management Institutions	268.8	98.8	3.2	1.2	-	-	272.0	1.3
4. Enviromental and Social Management Plan	472.8	98.8	5.6	1.2	-	-	478.4	2.3
Subtotal Strengthening resilience to droughts	14,669.8	82.8	2,743.1	15.5	309.1	1.7	17,721.9	84.6
B. Institutional Development and Project Coordination								
1. Institutional Support	234.8	100.0	0.0	0.0	-	-	234.8	1.1
2. Programme Management and Coordination	2,891.9	97.0	89.4	3.0	-	-	2,981.3	14.2
Subtotal Institutional Development and Project Coordination	3,126.7	97.2	89.4	2.8	-	-	3,216.1	15.4
Total PROJECT COSTS	17,796.5	85.0	2832.4	13.5	309.1	1.5	20,938.0	100.0

87. Project financing from IFAD broken down expenditure category is shown in Table 8 below.

Table 8: Expenditure Accounts by Financier for KIIWP 1 (USD'000)

	(RWF Million)			(US$ '000)			% Foreign Exchange	% Total Base Costs
	Local	Foreign	Total	Local	Foreign	Total		
A. Strengthening resilience to droughts								
1. Catchment rehabilitation and protection structures	2,979.7	3,962.9	6,942.6	3,485.0	4,635.0	8,120.0	57	41
2. Irrigation Development	3,454.2	3,454.2	6,908.4	4,040.0	4,040.0	8,080.0	50	40
3. Infrastructure Management Institutions	157.4	69.0	226.4	184.1	80.7	264.8	30	1
4. Enviromental and Social Management Plan	267.6	126.5	394.2	313.0	148.0	461.0	32	2
Subtotal Strengthening resilience to droughts	6,858.9	7,612.7	14,471.6	8,022.1	8,903.7	16,925.8	53	84
B. Institutional Development and Project Coordination								
1. Institutional Support	153.9	38.5	192.3	180.0	45.0	225.0	20	1
2. Programme Management and Coordination	1,580.0	885.9	2,465.9	1,848.0	1,036.1	2,884.1	36	14
Subtotal Institutional Development and Project Coordination	1,733.9	924.4	2,658.2	2,027.9	1,081.1	3,109.0	35	16
Total BASELINE COSTS	8,592.8	8,537.0	17,129.8	10,050.0	9,984.8	20,034.8	50	100
Physical Contingencies	106.9	106.9	213.8	125.0	125.0	250.0	50	1
Price Contingencies	736.7	683.1	1,419.8	338.6	314.6	653.2	48	3
Total PROJECT COSTS	9,436.3	9,327.0	18,763.3	10,513.7	10,424.4	20,938.0	50	105

88. **Co-financing arrangements.** It is anticipated that the total IFAD loan for KIIWP 1 is US$17.79 million (85 per cent). The GoR will contribute with US$2.83 million (13.5 per cent) in the form of tax exemptions and consultancies for the Ndego irrigation scheme; and DFID with a total of US$0.3 million (1.5 per cent) in the form of consultancies for Ndego irrigation scheme. Several development partners *esp.* the Korean International Cooperation Agency (KOICA), but also the African Development Bank (AfDB), the OPEC Fund for International Development (OFID), the Spanish Government and the European Union (EU) have expressed interest in co-financing KIIWP 2 once the results of the FS and ESIAs will be disclosed. DFID has already provided funds to the GoR for ESIAs in the Ndego sector. In case the level of co-financing for unexpected reasons will not be sufficient to fill the potential US$22 million financing gap in KIIWP 2, resources under IFAD 12 financing cycle will be accessed.

89. **Organisation and staffing/Embedded SPIU.** KWAMP and the other IFAD financed project coordination structures were designed to be housed within the SPIU within MINAGRI, staff recruited competitively or transferred from other projects under the same portfolio. This arrangement has facilitated quick start up of projects thanks to the dedication of the SPIUs staff and the transfer of knowledge from previous projects. The RAB has been designated as the Lead Project Agency (LPA) for KIIWP 1. RAB will ensure that where filling of staff positions will be through secondment, the assigned staff have the requisite qualifications and experience and are fully dedicated to the SPIU to facilitate their full attention on project needs. The project accountant, under the supervision of the SPIU Chief Accountant and the SPIU Head of Finance will be responsible for all accounting functions of the project including funds flow, preparation of annual financial statements, periodic financial reporting and overseeing the arrangements for audits, in accordance with GoR procedures and IFAD's audit requirements for the entire project.

90. At district level, it is proposed that a Project Accountant be recruited. The incumbent will work with the District finance department in processing documents, verifying recipients/payees, checking and collating documents for submission to SPIU. The district project accountant shall initiate transactions in the Integrated Financial Management Information Systems (IFMIS) for approval and authorisation by SPIU Headquarters.

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91. **Budgeting.** The GoR national budget calendar will be followed. Considering that the budget has to be input into IFMIS in accordance with the national budgetary rules and timetable the clearance process by IFAD should be well planned and executed to precede the GoR budgeting calendar.

92. The project will be implemented based on approved Annual Work Plans and Budgets (AWPBs). The budgeting process will be done jointly between SPIU and implementing partners using a bottom–up approach. The exercise will bring together Accountants, M&E Officers and Procurement Officers to ensure that the activities align to the log frame and the procurement plan is aligned to the AWPB. The SPIU will consolidate the AWPB, present it for approval by the PSC and submit it to IFAD with a request for a No Objection in accordance with the financing agreement and the PIM.

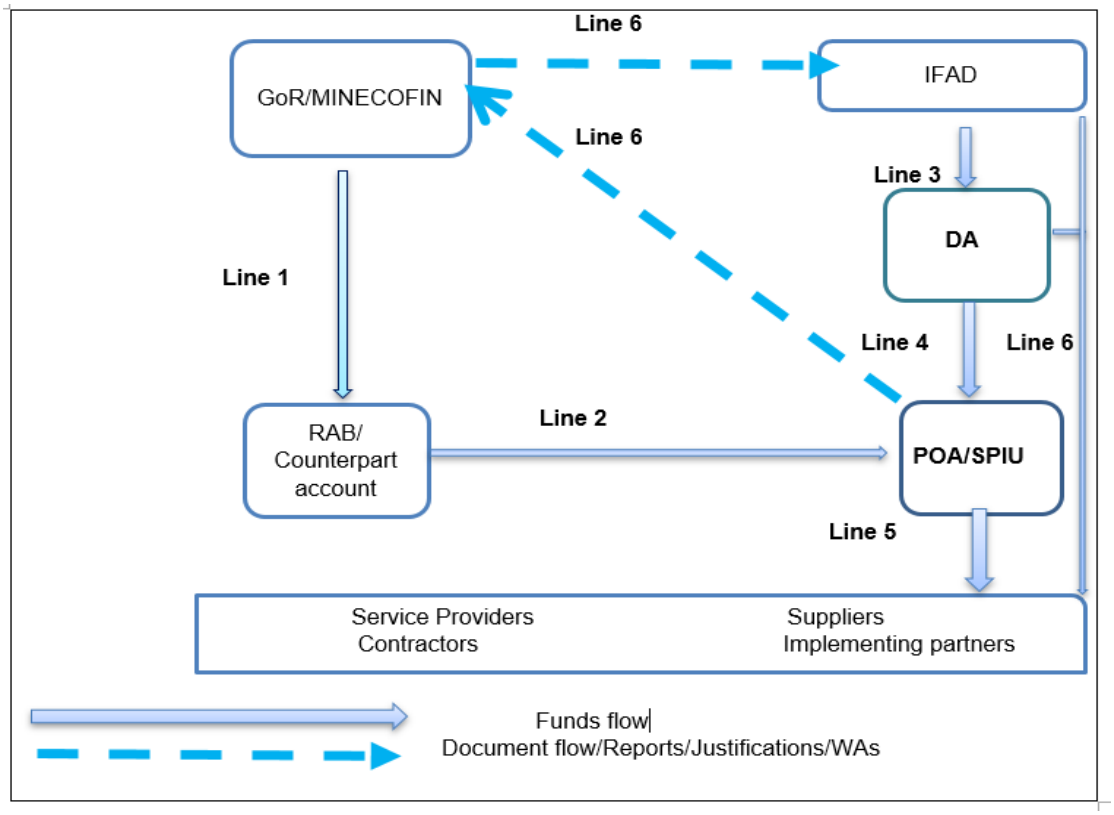
93. Disbursement arrangements and Flow of Funds – Project design has put into consideration financial management requirements that will ensure that the loan proceeds and other financing sources will be used for their intended purposes. This has been based on lessons learned under KWAMP and the RDDP that has been rolled into IFMIS.

94. **Designated/Operational Accounts.** Under KWAMP, there were three project accounts; the designated account, an operations account and a district account. The district account will not be necessary since accounting will be on the IFMIS platform. The funds flow arrangement (See Figure 2) however will require initiation of transactions at district level for district and lower level transactions since this will be the document processing, collation and verification point. One US dollar denominated account will be opened in the National Bank of Rwanda specifically to receive loan proceeds from IFAD. This account will be managed by SPIU under the supervision of RAB in accordance with GoR procedures. One project operating account in RWF will also be opened in the National Bank of Rwanda. These two accounts will be linked to IFMIS but will not be subjected to the daily zero balance requirements under the Single Treasury Account. The RWF operating account will be used for all local currency transactions while for transactions in respect of procurements undertaken/contracts entered in US dollars and foreign travel/foreign trainings authority will be sought from the Accountant General to draw US dollars from the designated account. No bank account will be opened at district level but transactions shall be initiated from the district on the IFMIS platform.

95. **Counterpart account.** GoR financing to meet expropriation costs, taxes and duties will be transferred into the RWF denominated Counterpart account held at the National Bank of Rwanda. This account will be managed by SPIU under the supervision of RAB in accordance with GoR procedures. The signing mandate will be defined when the SPIU structure has been defined. Payments will be transferred to the operating account from where payments will be made.

96. **Transfers to implementing partners.** Transfers to implementing partners will be done through a project operating account. These partners may be required to open bank accounts specific for KIIWP depending on the nature of activities and amount of advances to be received.

Figure 2: Funds flow chart



97. Line 1: GoR/MINECOFIN releases allocated funds to RAB Counterpart account for purposes of KIIWP in RWF. This will include funds for GoR expropriation, taxes and duties;

98. Line 2: Transfers from Counterpart account to the project operating account for payments;

99. Line 3: Transfers from IFAD to the designated account (DA) in USD following submission of the withdrawal applications;

100. Line 4: Transfers of funds from the DA to the Project Operating Account (POA) in RWF for payments of transactions denominated in RWF;

101. Line 5 and 6: Payments for goods supplied, works executed, services rendered, salaries and other expenses for Project implementation and management, both in local and foreign currencies. Foreign currency transactions are paid from the DA while there may be direct payments made from IFAD directly to the service provider/contractor/supplier or implementing partner; Quarterly financial reporting and Withdrawal Application submission to IFAD; and

102. Line 6: Necessary transactional documents are compiled/obtained from suppliers/contractors/service providers including evidence of completion of service/delivery of goods and justification from implementing partners and reported on to MINECOFIN and IFAD. Withdrawal applications also move along the same line.

Summary of benefits and economic analysis

103. **Project benefits.** KIIWP's development objective is to improve food security and incomes of rural households on a sustainable basis. Project interventions are expected to result in an extensive range of tangible and intangible benefits. Key quantifiable

benefits include: i) increased value of agricultural production in marshlands; ii) crop diversification and increased value of production in hillside areas; iii) reduced post-harvest losses and increased sales in output markets; iv) increased value of livestock production; v) improved access to water for domestic uses. These benefits will be achieved through project interventions such as: i) water infrastructure development; ii) promotion of climate smart agriculture and animal husbandry practices; iii) capacity building for farmers to access markets for agricultural inputs, finance and outputs; iv) promotion of sustainable land and water management practices.

104. **Economic and financial analysis.** The EFA shows satisfactory results, with an Economic Internal Rate of Return (EIRR) of 15.06 per cent and a Net Present Value (NPV) of US$1.03 million at a 12 per cent economic discount rate. Sensitivity analysis carried out shows that the economic profitability of KIIWP 1 would remain satisfactory even if the project costs increase by 21 per cent, the project benefits decrease by 18 per cent or if the benefits lag behind by twop years. Economic benefits derive from increased value of agricultural production and the value of improved access to water for domestic and livestock uses. Benefits also include the improvement of living conditions and nutrition, the positive spill-over effects of capacity building on the local community, and reduced land lost due to soil erosion control.

105. The overall EFA shows that KIIWP 1 and KIIWP 2 are financially profitable for rural households engaged in agricultural production with financial internal rate of return for farmers ranging from 20 to 27 per cent depending on the production system. The sensitivity analysis shows that the economic profitability would remain satisfactory even if the project costs increase by 46 per cent, the project benefits decrease by 31 per cent or if the benefits lag behind by two year. More details of the Project economic and financial analysis are included in Annex 4.

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Exit Strategy and Sustainability

106. **Exit strategy.** The project will be implemented by RAB and through district teams and the private sector will be engaged from the earliest possible opportunity. The government entities are permanent structures that will be able to absorb support activities after the end of the project.

107. Interventions supported by the project will be owned by community organisations that will be trained to operate and manage them. Users of the infrastructure will be involved from the studies, construction and operation and maintenance. Operation and maintenance manuals will be prepared in the language best understood by the users and the users trained. At the beginning of the construction, RAB will sign an implementation agreement with the potential users of the infrastructure that will clarify the roles and responsibilities of the parties.

108. Each irrigation scheme, borehole and valley bottom tank will be handed over to the users on partial completion of the works and a handover certificate will be issued at full handover. The handover certificate will also indicate the responsibilities of the government and the users during the operational phase. The project will gradually withdraw from each intervention after the handover is done, but government agencies in extension, water resources management and natural resources among others, and the private sector will take over.

109. **Institutional sustainability.** Infrastructure management institutions like Sector- and District-level Steering Committees and Sub-Catchment Committees will play an active role in the design, construction and operation and maintenance of infrastructure supported by KIIWP 1. The sustainability of the water resource and irrigation schemes

will be further enhanced by the six WUOs and 35 WLUOs to be strengthened and/or developed by the project.

110. **Social sustainability (Empowerment).** Using Farmer Field Schools as a basis for smallholder farmers to become accustomed to working together and sharing knowledge and information will build trust over time and become a sustainable basis for them to establish more formal associations like WUOs and WLUOs, and cooperate in activities related to the production and marketing of their products. As for cooperatives, using long term coaching and mentoring support instead of one off training will increase their chances of success and long term sustainability.

111. **Participation of the private sector.** KIIWP 2 will involve private-sector entrepreneurs such as large-scale farmers, wholesalers, processors and exporters, as well as financial institutions operating at both local and national level. The delivery of water services, provision of agricultural advisory services, backward linkages to input suppliers and financial service providers, forward linkages to markets, and direct co-investments in post-harvest infrastructure are some of the key tools that will promote the development of mutually beneficial business relationships between KIIWP target groups and private stakeholders, and thus enhance the long term sustainability of the project's investments.

112. **Economic and financial sustainability.** The **economic and financial analysis (EFA) of KIIWP 1** shows that the project would be profitable with an Economic Internal Rate of Return (EIRR) of 15.06 per cent and a Net Present Value (NPV) of US$1.03 million at a 12 per cent economic discount rate. Sensitivity analysis carried out shows that the economic profitability of KIIWP 1 would remain satisfactory even if the project costs increase by 21 per cent, the project benefits decrease by 18 per cent or if the benefits lag behind by two years. Economic benefits derive from increased value of agricultural production and the value of improved access to water for domestic and livestock uses. Benefits also include the improvement of living conditions and nutrition, the positive spill-over effects of capacity building on the local community, and reduced land lost due to soil erosion control.

113. The overall EFA shows that KIIWP 1 and KIIWP 2 are financially profitable for rural households engaged in agricultural production with financial internal rate of return for farmers ranging from 20 to 27 per cent depending on the production system. The sensitivity analysis shows that the economic profitability would remain satisfactory even if the project costs increase by 46 per cent, the project benefits decrease by 31 per cent or if the benefits lag behind by two years.

114. **Environmental sustainability.** The integrated watershed management practices will consist of good integration between crop and livestock production, combined with the promotion of a wide range of cost-effective erosion control and water retention measures [20]. KIIWP 1 and KIIWP 2 environmental sustainability will be further enhanced by the adoption of adaptation and mitigation measures through water harvesting [21] and climate-smart storage [22] technologies, that will be determined according to specific site locations, size of irrigation schemes, and production systems. In small irrigation schemes, solar energy to pump water will be considered to avoid the use of expensive and GHG emitting fossil fuels.

[20] e.g. tree belts, contour belts, grass strips, contour bunds, planting of fodder grasses on bunds/ridges, use of permanent, perennial vegetation on contours, etc.

[21] e.g. rainwater and floodwater harvesting, water storage units, etc.

[22] e.g. zero energy cooling chambers, metal silos or hermetic bags for storing grains/cereals, drying grounds and improved warehouses, etc.

115. **Enabling policy environment.** The project will benefit from a highly enabling policy and institutional environment, with a series of new laws and policies coming into force that are fully supportive of the development of water infrastructure and cooperative development. Identified policy gaps[23] will be addressed with project support both in KIIWP 1 and KIIWP 2.

3. Risk

Project risks and mitigation measures

116. The following are the main risks and the proposed mitigation measures for KIIWP 1[24]:

Main risks	Mitigation measures
Technical design of project: FS/ESIAs find that some of the six proposed irrigation sites are not viable/feasible/appropriate	The project will be implemented in two phases to initially undertake the necessary preparatory activities for irrigation development and address the urgent need for catchment rehabilitation and protection in rainfed farming areas and improved water supply for livestock. The detailed design of KIIWP 2 will be informed by extensive analytical work beforehand. KIIWP 1 will not only conduct FS/ESIAs for six potential irrigation schemes, it will also prepare a pipeline of about 5,000 hectares of investment-ready irrigation schemes, in case the pre-identified areas fall short of the target area for development.
Eastern Province's vulnerability to cyclical and persistent drought events	KIIWP is designed in direct response to the climate-related risks. KIIWP will adopt an integrated watershed management approach and a wide range of cost-effective erosion control measures will be promoted. Resilience will also be strengthened through the promotion of climate smart agriculture.
Competition between water users in times of scarcity (especially irrigators and cattle owners).	KIIWP 1 provides for increasing water storage (small valley dams) or (solar powered) boreholes for livestock. Catchment water management committees will be strengthened, in order to support joint management of limited water resources.
Land tenure issues and conflict with landless rural population who may be livestock owners	With regard to land tenure, the project will promote cadastral surveys to identify who the right owner is and the land parcel size. Social Management Plans will be facilitated by the project and prepared in consultation with project affected people and disclosed locally, to allow all stakeholders, including livestock keepers, to participate and raise any concerns. ESIAs will identify existing/potential risks and specific mitigation measures which will inform the project strategy.
Weak technical and institutional capacities can lead to slow disbursement, lower project benefits as well as delays in implementation.	Raising awareness and capacity building are key elements, especially of FOs and District, Sector and Cell level staff. The SPIU is already in place with core staff. Involvement of experienced technical KWAMP staff will also speed up project implementation. Supervision and implementation support missions, especially in the first two years will support focused project implementation.

[23] e.g. (i) support to national policy on contract farming; (ii) support to law on financial lease for agricultural equipment; (iii) discussion on VAT in rice processing that makes Rwandan rice less competitive with regional products; (iv) current issues of availability and quality of seeds, including multiplication.

[24] See Annex 13 for other risks and mitigation measures foreseen in KIIWP 2

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Environment and social category

117. **The preliminary environmental and social category of KIIWP is A. However, KIIWP 1 is category B, as it focuses on preparatory studies for irrigation schemes, integrated watershed management and planning activities.** KIIWP 2 will include investments on water harvesting and storage, irrigation infrastructure development (area >100 hectares) and marshland development, that may be categorised as A.

118. The ESIAs will be aligned with the national General Guidelines for Environmental Impact Assessment (2006) and the Environmental and Social Management Guidelines for agriculture projects (2016). ESIA certificates are site-specific and valid for the entire project implementation phase. All FS for irrigation schemes, hydro-geological surveys for boreholes drilling and valley ponds, water permit requests and ESIA procedures will be financed and initiated during KIIWP 1 of project implementation.

119. The whole project will be coordinated through an Environmental and Social Management Framework (ESMF) to examine the risks and impacts of the proposed activities, including potential environmental and social vulnerabilities. The ESMF specifies the environmental and social management requirements (including labour and working conditions, grievance redress system, health and safety) that will be the responsibility of contractors and primary suppliers hired to construct the irrigation infrastructure. Environmental and climate change management plans will be developed for each site.

Climate risk classification

120. As a result of recent droughts events and the vulnerability of the Eastern Province to extreme events, the preliminary climate risk classification is High.

121. Climate change impacts in Rwanda vary depending on agro-ecological zones; while the North and Western provinces are more affected by flood events, Eastern and Southern provinces are more vulnerable to drought events. The impact of floods and droughts associated with El Nino and La Nina events of recent years are thought to have been exacerbated by climate change and the environmental degradation observed throughout the country (NAPA, 2006; IPCC, 2014). Over the last decade, droughts tend to be cyclical and can be persistent.

122. The mean annual temperature is expected to increase up to 3.25°C for the East Africa region by the end of the century resulting in proliferation of diseases, crop decline and reduced land availability, which in return, affects food security and livestock production. Rainfall variability is more uncertain, though most of the models predict more extreme events with higher rainfall intensities leading to landslides, crop and livestock products losses, health risks and damages to infrastructure. The FS to be undertaken will include climate risk analyses for the irrigation schemes to inform the site specific environmental and climate change management plans. In addition, PASP activities also include detailed climate vulnerability analyses for the selected value chains, which will also inform the management plans.

123. An in-depth climate vulnerability analysis will also be undertaken by the University of Cape Town with ASAP 2 financing. The results will be ready by September 2019 and will inform the climate change adaptation activities in KIIWP.

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4. Implementation

Organisational Framework

Project management and coordination

124. The institutional arrangements for KIIWP are fully aligned with the current implementation framework of IFAD-funded projects in Rwanda. This framework rests upon the below principles and operational modalities.

125. Single Project Implementation Units (SPIU) were created as an effective institutional framework that will guide the process of designing and implementing projects that are earmarked to fast track the realization of Rwanda development targets. For KIIWP implementation, IFAD SPIU is strategically positioned to manage the ongoing and future projects. Benefits to be derived from the established SPIUs include among others (i) realization of economies of scale and reduction of transaction costs; (ii) improved coordination and creation of synergy; (iii) efficiency and effectiveness in project implementation oversight through improved M&E; (iv) improved staff retention leading to reduction in staff turnover and increase in institutional memory, and (v) increased knowledge and expertise as well as best practices in project management.

126. The Lead Project Agency will be the RAB, under the auspices of MINAGRI. RAB Chief Executive Officer will consequently become the Chief Budget Holder for the said project, together with RDDP and PASP that were transferred under it.

127. The SPIU coordinator in place will also oversee and coordinate KIIWP activities that will be implemented at both the central and district level. In addition to the existing SPIU staff performing cross-cutting functions of finance/accounting, M&E, procurement and administration, KIIWP staff will be recruited to support its implementation. The proposed KIIWP staff positions include: a Programme Manager, an accountant, an M&E officer in charge also of gender and youth, an irrigation officer, an electromechanical engineer, a civil engineer, an environment, climate and social safeguards officer, and a procurement officer.

128. Specific for the accountant and the procurement officer, in order to benefit from their experience in IFAD procedures, KIIWP should retain staff that have been performing similar tasks in PASP since the project is coming to an end. Involvement of experienced technical former KWAMP staff too, would be an added advantage since it would enable the full integration of lessons learned in Kirehe District and would speed-up project implementation as they will be able to "hit the ground running". This especially relates to the following experienced former KWAMP staff: Irrigation Engineers, WUO Specialist, Land Husbandry (SWC) Engineer, Cooperative Development Officer, and Irrigation Technicians.

129. At the district level, implementation will follow the devolution principle and day to day management of KIIWP 1 will be delegated by RAB to a District-level Project Coordination Unit (PCU) within the District of Kayonza. The PCU will be the main executing agency of KIIWP 1 at the district level. While Kayonza District already has some personnel that will support KIIWP implementation in addition to their normal district duties, the following additional staff are proposed to supplement district capacity to provide public services. These positions were identified as "missing expertise" during the stakeholders' workshop held in Kayonza on 30 April 2018: an accountant for initiating KIIWP transactions at district, a WUO/WLUO specialist, a land husbandry (SWC) engineer, a cooperative development officer, a horticulture specialist and an irrigation technician.

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130. The above personnel will be recruited and paid by the SPIU since these positions are not part of the mandated national structure for all districts. However, in order to promote local government involvement and ownership, the contracting and performance management of the said staff will be delegated to the district officials. These arrangements are in line with current implementation arrangements of IFAD-supported projects (namely PASP and RDDP) under the SPIU that pays for district field staff salaries.

131. **Project oversight**. In line with the practice for other IFAD-funded projects in Rwanda, a Project Steering Committee (PSC) would be established. The role of the PS of MINAGRI as Chair of the PSC has been confirmed by MINAGRI. Its membership will be determined by MINAGRI and shared with IFAD.

132. **Other implementation arrangements.** The components will mainly be implemented through service providers and implementing partners, including RAB. For service providers and implementing partners, contracting and partnership will be based on renewable performance-based contracts or Memorandum of Understanding (MoUs).

Financial management, procurement and governance

133. **Implementation arrangements, and governance.** RAB will be the LPA - implementing the project on behalf of the Ministry of Finance, the borrower. The SPIU will be responsible for overall project implementation in consultation with other relevant national agencies and ministries to ensure consistency with national policies. The SPIU established at national level will be composed of project staff either seconded or recruited, and will be headed by the SPIU Coordinator. The SPIU will be accountable to the RAB Director General who will be the executive level head responsible for the strategic direction of the project. The SPIU will be responsible for project coordination and management of fiduciary issues in conformity with the standards and requirements agreed upon between GoR and IFAD.

134. A Project Steering Committee will be established, chaired by the PS, MINAGRI, or his/her nominee, and composed of the RAB Director General, RAB Head of Corporate Services and representatives from ministries and institutions with direct relevancy to the achievement of KIIWP's goal and development objective including MINECOFIN. The PSC will provide strategic guidance towards the achievement of project objectives and contribute to the higher level sector policy and strategic goals. The PSC will also be responsible for review and approval of AWPBs and annual reports.

135. **Disbursement arrangements and Flow of Funds.** One US$ denominated account will be opened in the National Bank of Rwanda specifically to receive loan proceeds from IFAD. This account will be managed by SPIU under the supervision of RAB in accordance with GoR procedures. One project operating account in RWF will also be opened in the National Bank of Rwanda. These two accounts will be linked to IFMIS but will not be subjected to the daily zero balance requirements under the Single Treasury Account. The RWF operating account will be used for all local currency transactions while for transactions in respect of procurements undertaken/contracts entered in US$ and foreign travel/foreign trainings authority will be sought from the Accountant General to draw US$ from the designated account. No bank account will be opened at district level but transactions shall be initiated from the district on the IFMIS platform.

136. **Financial Management Risk Assessment.** Overall assessment indicates that Rwanda is a medium risk country, characterized by strong financial management systems and internal controls. The last PEFA assessment of Rwanda was in 2016. Compared to the previous one carried out in 2010, seven of 11 indicators improved

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while four indicators remained the same. With regard to government accountability, transparency and corruption factors, the most recent Transparency International perception index shows that Rwanda scored 55 on the 1 – 100 scale with a global rank of 48 out of 180 countries assessed and being the third least corrupt Country assessed in Sub-Saharan Africa. The IFAD overall fiduciary risk based on the ongoing projects and the recently closed KWAMP has been assessed as low.

137. The implementation arrangements that pose a risk of low disbursements may arise from delays in start-up due to delays in re-defining the SPIU, delays in carrying out the Environmental and Social Impact Assessments (ESIAs) that are a condition for approval of major irrigation infrastructure and delays in reconfiguring the project chart of accounts that may cause delays in submission of withdrawal applications; delays in financial reporting, among others.

138. **Accounting Systems.** The accounting systems, policies, and procedures to be used by the SPIU will follow GoR systems. To ease application, these will be documented in the Financial Procedures Manual. The manual will describe the accounting system, internal control procedures, basis of accounting, standards to be followed, and authorization procedures, segregation of duties, financial reporting process, budgeting procedures, financial forecasting procedures, and contract management. In addition, the manual should document processes to be undertaken for the disbursement of expenditure and auditing arrangements.

139. **External Audit.** The recently closed KWAMP and the ongoing projects are audited by the Auditor-General as part of its mandate. Previous audits done by the Auditor General have been rated highly satisfactory by IFAD noting the level of detail and the use of INTOSAI, acceptable standards to IFAD. It is proposed that in line with IFAD's commitment to support continued development of government systems, KIIWP external audits will be carried out by the Auditor General. KIIWP financial statements will be prepared in accordance with the International Public Sector Accounting Standards. IFAD audit guidelines will be used in preparation of audit terms of reference and key disclosures as required by IFAD will be included in the audited financial statements. In addition to the opinion of financial statements, opinions on the Statements of Expenditure and the operation of the Designated Account shall be provided. Any other requirement will have to be adhered to as shall be provided for in the IFAD audit guidelines. A Separate Management Letter highlighting observations on the internal controls, recommendations and management responses will also be a requirement.

Procurement

140. **Procurement risk assessment.** Based on the most recent 2017 PEFA report that covered the period 2013-2014, there is overall compliance with the procurement law and its regulations and an increasing degree of transparency in Rwanda, indicating that the procurement system is strong and demonstrating increasing value for money in the purchases of goods and services. The only challenge that was noted in procurement was the failure by procuring entities to comply with the act requiring entities to do the publication of the competition results as soon as the contract is signed by both parties.

141. The procurement of goods, works and services will be carried out in accordance with government regulations, with the addition that it should comply with IFAD requirements to be specified in the Letter to the Borrower and the Financing Agreement. The IFAD SPIU already in place under RAB will be responsible for the procurement of goods, services and works at the national level. The recruitment of a

Procurement specialist will be budgeted to ensure that KIIWP-related procurements are well executed and monitored.

142. Districts will be actively involved in contract tendering and management wherever possible. Procurement at the district-level will be delegated to the District's Corporate Division that includes the two procurement officers currently available at the district. Their unit will be responsible for all procurement actions at the district, within the limits specified and to be agreed below. IFAD considers the procurement capacity of the district to be satisfactory, and this arrangement builds on the experience of KWAMP whereby the Kirehe district was also responsible for certain procurement actions at the district level. Procurement personnel at the district will be paid by KIIWP. The District Tender Committee will be responsible for the advertisement of tenders and the approval of the evaluation recommendations.

Planning, M&E, Learning, KM and Communications Plans

143. **Planning** will be guided by the project's strategy, logframe and broader results framework which will inform the development of annual work. A draft annual work plan and budget (AWPB) will be drawn up in consultation with implementing partners, including beneficiaries (e.g. cooperatives) where relevant. The SPIU will be responsible for the process and for the inclusion of and collaboration with key stakeholders in the planning process. AWPBs will be cleared by the project steering committee and sent to IFAD for no objection 60 days prior to the end of each programme year.

144. **Monitoring and evaluation** will be embedded in project management, coordinated by the SPIU and supported by additional professional staff who will work closely with subject-matter specialists to strengthen learning and knowledge management. The M&E system will be aligned with MINAGRI's new management information system and IFAD's new Operational Results Management System (ORMS).

145. The M&E system will be participatory, gender sensitive and results-oriented while enabling the integration of physical and financial progress reporting. In addition, the system will enable the analysis of climate change vulnerability among the beneficiaries. The system will incorporate in-depth baseline and completion surveys, a mid-term review and other thematic studies as relevant, including qualitative studies. The baseline surveys will include context-specific needs assessments of the concrete barriers to smallholder-driven agricultural sector development in the eight drought-prone sectors and address pressing information needs for implementation planning.

146. Relevant indicators have been specified in KIIWP logframe and, to the extent possible, quantified. The indicators relate to the different levels (output, outcome and impact), and include IFAD Core Indicators (CIs) as well as project specific indicators. This is based on the theory of change, and demonstrates the logical links between the results at their different levels and thereby enables the meaningful analysis of whether the project is on-track towards its planned results even in the first few years of implementation when higher-level results are not yet expected.

147. The following will be the key elements of the M&E system for KIIWP 1: (i) an M&E manual detailing scope, organisation and contents of the M&E system; roles and responsibilities; how data (sex- and age-disaggregated where appropriate) will be collected, analysed, reported, used and otherwise managed; timeline for M&E-related activities; staffing and capacity building plan; budget; etc.; (ii) annual M&E plans; (iii) project results chain, results framework and log frame; (iv) Management information system; (v) baseline and completion surveys; (vi) mid-term review; (vii) annual outcome surveys; (viii) continuous progress monitoring of activities and outputs; (ix) risk assessment; (x) thematic studies, e.g. on targeting, gender, youth,

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formation of WLUOs, etc.; (xi) IFAD ORMS reporting; and (xii) field visits and joint implementation reviews.

148. **Learning and knowledge management (KM).** The core relevance of the M&E system is in the use of the information it elicits for planning and decision-making as well as accountability. The FS and ESIAs in KIIWP 1 will provide critical elements to further shape interventions in KIIWP 2. The FS will provide specific indications on adequate cost-effective irrigation technologies, availability of water, key crops, capacity level of farming organizations, available/potential markets, inputs on correct mitigations strategies, appropriate institutional arrangements and thorough risk assessment of the proposed investments. All these will inform the shaping and detailed design of KIIWP 2.

149. A KM strategy for the drought-prone agricultural sectors (in alignment with the broad KM and communication strategy of MINAGRI) will be developed built on three core pillars of KM: people, processes and technology. Quarterly review meetings with implementing partners will be organised by project management to discuss progress towards results in relation to each quarterly progress report, the format of which will explicitly include a focus on lessons learnt in terms of challenges, good practices, etc. Study tours, exchange visits and learning routes will be organised for lateral knowledge transfer.

150. Concurrently, a downward and upward flow of information about project progress to beneficiaries and implementing partners in the field is of utmost relevance in fostering ownership and participation. Systems for these information exchanges will be developed and used on a regular basis, including stakeholder review meetings, planning workshops, and a newsletter to be shared with all WLUOs, FOs and cooperatives involved in project implementation. The project will collaborate with the Agricultural Information and Communication Centre within MINAGRI to produce relevant knowledge products and communication materials, such as press releases, extension materials, and radio spots.

Innovation and scaling up

151. KIIWP will innovate in the management models for irrigation systems by arranging for private sector participation as service providers. The project will facilitate management agreements between the farmers, government and private sector partners for the management of irrigation infrastructure and water service provision to farmers. The farmers will be responsible to pay for a water service fee. This arrangement will be implemented at each of the large pumped irrigation schemes to be developed. This approach is an innovation in Rwanda, but has been successfully tried in Zambia.

152. Another innovation that the project will introduce is the use of standalone solar powered pumping stations. The current model that has been tried in Rwanda is solar feed-into-grid systems. The FS will investigate the potential for standalone solar power stations for irrigation in the project area. If the potential of this technology is viable, this can be scaled up to other areas in Rwanda. For such scaling up to take place, innovative models for the ownership, management and financing of the solar power stations and electricity tariffs (if any) for the irrigation farmers will be analyzed. In addition, small-scale solar pumps will be used for valley bottom tanks for the watering of livestock. The project will scale up the successful models that are already in place in Rwanda.

Implementation readiness and start-up plans

153. The actions needed to mitigate financial management risks are summarised below.

Table 9: FM Actions Summary

	Action	Responsible Party / Person	Target Date / Covenants
1	Finalisation of the project's AWPB and PP, approved by relevant authorities and IFAD	SPIU/RAB	Prior to disbursement
2	Constitute an SPIU headed by a Coordinator with dedicated staff recruited on fixed term performance-based contracts	Director General/RAB	Within first six months of entry into force
3	Update the PIM that should include a comprehensive financial management manual with a comprehensive project chart of accounts	SPIU/RAB	Within first six months of entry into force
4	Establish a PSC headed by the Permanent Secretary – MINAGRI	PS/MINAGRI	Within six months of entry into force
5	Map the accounts codes and configure the chart field to meet the accounting and reporting requirements of project.	SPIU/RAB/IFMIS Team-MINECOFIN	Part of start-up activities and continuous

154. **Supervision and Implementation Support Plan for Financial Management.** One supervision mission and one follow up mission are proposed per year in accordance with the current IFAD supervision and implementation support arrangements. Once FS and ESIAs will be finalized during implementation, a thorough review of project results will be conducted to assess whether conditions have been met to move to the next phase and update the design of KIIWP 2. During the early set up of IFMIS, additional financial management implementation support should be provided to ensure that the key challenge of IFMIS chart field coding is correctly done and addressed at start up to satisfy all reporting requirements. Financial management supervision will among others review existence and adequacy of financial management and accounting systems including internal controls, funds flow and liquidity management. It will also comprehensively review the Statements of Expenditure (SOEs) to establish eligibility of expenditure claimed, timeliness of the claims and adequacy and completeness of supporting documentation.

Supervision, Mid-term Review and Completion plans

145. **Project supervision.** KIIWP 1 activities will be directly supervised by IFAD. IFAD will undertake twice yearly supervision and implementation support missions to assess project implementation status, in collaboration with Government and partners. In addition, IFAD will be responsible for (i) Reviewing withdrawal applications for IFAD proceeds; (ii) Reviewing and approving on a no-objection basis all procurement under the project financed by IFAD funds; (iii) Monitoring compliance with the Financing Agreement, recommending remedies for any substantial non-compliance; and (iv) Carrying out all other functions needed to administer the financing and supervise the project.

146. **Reporting arrangements.** The SPIU will submit bi-annual progress reports according to a format acceptable to IFAD. These reports will include **physical** and **financial** progress updates. Physical reporting will be done against a set of indicators based on the logframe. Financial reporting will be done against the approved budget.

147. KIIWP's **impact evaluation** will follow the same methodology as the baseline study to **allow** meaningful comparison, although the scope of the impact **evaluation** may be broadened to cover other aspects of project relevance, effectiveness, efficiency, impact and sustainability to adequately inform the project's **completion report**.

Annexes:

Annex 1: Logical Framework (all phases with KIIWP 1 highlighted in green)

Results Hierarchy	Indicators				Means of Verification			Assumptions (A) / Risks (R)
	Name	Baseline	KIIWP 1	KIIWP 1 + KIIWP 2	Source	Frequency	Responsi-bility	
Outreach	**Persons receiving services promoted or supported by the project**							
	Total number of persons receiving services	0	32,250	225,000				
	Males - Number	0	16,125	112,500				
	Females - Number	0	16,125	112,500				
	Youth - percentage	0	30%	30%				
	Corresponding number of households reached							
	Households - Number	-	7,167	50,000				
Project Goal Contribute to poverty reduction in the drought prone Eastern province of Rwanda	**Number of female- and male-headed households that experience an increase in household assets**				National statistics, household surveys incl. poverty & gender studies	Baseline and completion	SPIU	Increased income will be used on household improvements
	Households - Number	0	5,734	40,000				
	Number of children 0-5 years suffering from malnutrition				National statistics	Baseline, mid-term, completion	SPIU	Increased income accompanied by nutrition education and behaviour change will lead to greater availability of and access to a diversified diet and nutrient-rich crops/ food items.
	Stunting (children 0-5 years) - Percentage (%)	42.4%		30%				
Development Objective Improve food security and incomes of 50,000 households on a sustainable basis	**Households with improved food security and income**				National statistics, household surveys incl. poverty & gender studies	Baseline and completion	SPIU	Food security and incomes increase through a combined effect of increased crop and livestock production and improved market access. Government agriculture and SME policies remain in place over the project life (A)
	Total Number Households	0		50,000				
	Males-Number	0		112,500				
	Females - Number	0		112,500				
	Youth - percentage	0		30%				
Outcome A Farmers drought resilience strengthened	**Number of persons reporting increase in production (CI 1.2.4)**				Impact assessment report, Project reports	Baseline, mid-term, completion	SPIU/RAB /MINAGRI	The combined investments in infrastructure construction, organizational strengthening and support on agricultural practices lead to higher yields for crops and livestock (A).
	Total Number	0		225,000				
	Males - Number	0		112,500				
	Females - Number	0		112,500				
	Youth - percentage	0		30%				
	Number of persons reporting improved access to land, forests, water or water bodies for production purposes (CI 1.2.1)				Service provider report	Quarterly MTR Completion Report	SPIU/RAB	The planned project activities lead to improved access to water or water bodies.(A)
	Total Number	0	11,250	225,000				
	Males - Number	0	5,625	112,500				
	Females - Number	0	5,625	112,500				
	Youth - percentage	0	30%	30%				

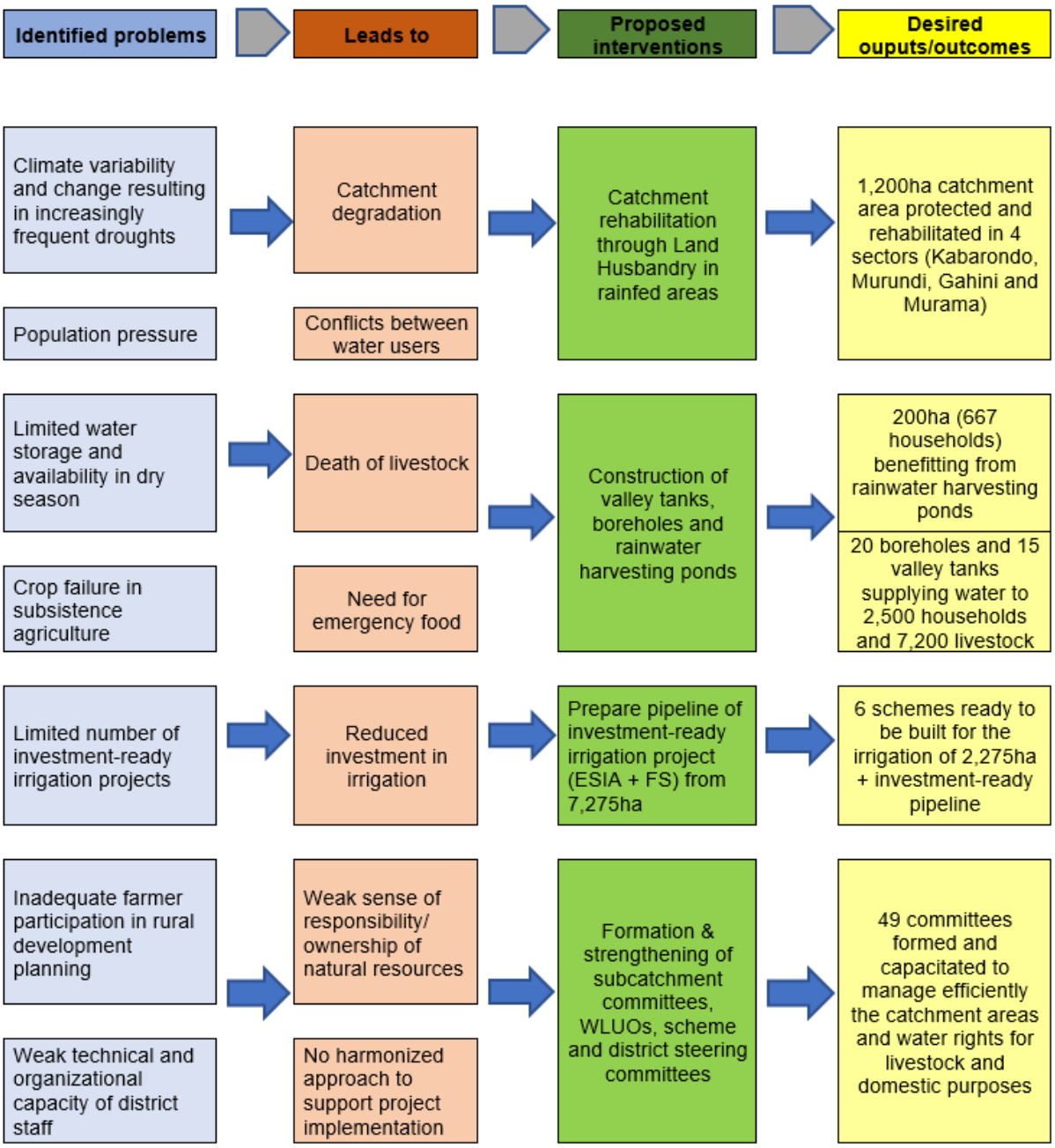
Notes: Average household size in Eastern province is 4,5 - Project goal: an estimated 80% of beneficiaries increase their assets

Results Hierarchy	Indicators				Means of Verification			Assumptions (A) / Risks (R)
	Name	Baseline	KIIWP 1	KIIWP 1 + KIIWP 2	Source	Frequency	Responsi-bility	
Output A.1 Catchment rehabilitation and protection	**Number of hectares of land brought under climate resilient management (CI 3.1.4)**				Service provider report	Quarterly MTR Completion Report	SPIU/RAB	Climate-resilient management, including terracing and agro/forestry will be complemented by reforestation programmes under RWFA (A).
	Hectares (ha)	0	1,400	5,350				
	Number of valley tanks and boreholes constructed				Service provider report	MTR & Completion Report	SPIU/RAB	Assessment studies will find adequate sites suitable for borehole drilling
	Infrastructure - Number		35					
Output A.2 Irrigation development	**Gross area of land covered by feasibility studies and ESIAs**				Feasibility studies and ESIAs	MTR	SPIU/RAB	Assessment studies are implemented on time
	Hectares (ha)	0	7275					
	Number of hectares of farmland under water-related infrastructure constructed/rehabilitated (CI 1.1.2)				Service provider report	Quarterly MTR Completion Report	SPIU/RAB	Assessment studies will find adequate sites suitable for rainwater harvesting
	Hectares (ha)	0	0	2,275				
Output A.3 Infrastructure management institutions	**Number of groups supported to sustainably manage natural resources and climate-related risks (CI 3.1.1)**				SPIU	Quarterly	SPIU/RAB	Local leadership is supportive, and all needs from different water users can be reconciled (A).
	Total number Groups	0	49	55				
	Males -Percentage	0	60%	60%				
	Female - percentage	0	40%	40%				
	Youth - percentage	0	25%	30%				
Output A.4 Enhanced CSA and AH practices and technologies	**Number of rural producers trained in production practices and/or technologies (CI 1.1.4)**				Service provider report	Quarterly	SPIU/RAB	FFS training is provided to 800 groups under close supervision by RAB and District/Sector Agronomists (A)
	Total Number	0		20,000				
	Males - Number	0		10,000				
	Female number	0		10,000				
	Youth - percentage			30%				
	Number of persons provided with targeted support to improve their nutrition (CI 1.1.8)				Service provider report	Quarterly	SPIU/RAB	Increased production combined with targeted capacity building will lead to improved domestic diets and consequently nutrition
	Total Number	0		25,000				
	Males-Number	0		12,500				
	Females – Number	0		12,500				
	Youth – percentage			30%				
	Total Number	0		20				

Results Hierarchy	Indicators				Means of Verification			Assumptions (A) / Risks (R)
	Name	Baseline	KIIWP 1	KIIWP 1 + KIIWP 2	Source	Frequency	Responsi-bility	
Outcome B Farm business development; Increased, sales and linkage of producers to services and markets	**Number of rural producers' organizations reporting an increase in sales (CI 2.2.5)**				Service provider report	Quarterly	SPIU/RAB	Cooperatives remain the focus for GoR support to development of SMEs and agricultural value addition (A) Favourable economic environment with attractive domestic//export prices (A)
	Total Number Groups			20				
	Males - Number			Tbd				
	Female number			Tbd				
	Youth - percentage			30%				
	Number of rural producers' organizations engaged in formal partnerships/agreements or contracts with public or private entities (CI 2.2.3)				Service provider report	Quarterly	SPIU/RAB	Cooperatives will want to engage in formal agreements (A). Public or private entities are willing to engage with project (A).
	Total Number groups			20				
	Males - Number			Tbd				
	Female number			Tbd				
	Youth - percentage			30%				
Output B.1 Development Farming as a Business Skills	**Number of persons trained in Farming as a Business skills**				Service provider report	Quarterly	SPIU/RAB	Farmers are interested in developing their operational and business development skills (A)
	Total Number	0		20,000				
	Males-Number	0		10,000				
	Females - Number	0		10,000				
	Youth - percentage	0		30%				
Output B.2 Promotion of mechanization, PH storage and irrigation technologies adapted to smallholder agriculture	**Number of persons provided with climate information services (CI 3.1.2)**				Service provider report	Quarterly	SPIU/RAB	Detailed local climate information is accurate and available.
	Total Number	0		Tbd				
	Males-Number	0		Tbd				
	Females - Number	0		Tbd				
	Youth - percentage			30%				
Output B.3 Supporting backward and forward market linkages	**Number of target households reporting using rural financial services**				Service provider report	Quarterly	SPIU/RAB	System of subsidies does not distort the financial services market (R)
	Total Number	0		25,000				
	Female-headed - percentage	0		30%				
	Youth-headed - percentage	0		30%				
	Number of financial service providers supported in delivering outreach strategies, financial products and services to rural areas (CI 1.1.6)				Service provider report	Quarterly	SPIU/RAB	Financial institutions are ready to invest in irrigated agriculture and livestock keeping (A)
	Total Number			30				
	Number of formal supply contracts signed between cooperatives and traders/processors				Service provider report	Quarterly	SPIU/RAB	Cooperatives and traders/processors are interested in developing mutually beneficial business relationships (A)
	Total Number	0		20				
Outcome C Policy dialogue and institutional environment	**Number of national policies operationalized at local level**				Rwanda Standards Board records	Bi-annually	SPIU	Budget for policy implementation is availed by GOR and capacity exists for operationalization at local level (A).
	Total Number	0	2	6				

Annex 2: Theory of Change

The Theory of Change of KIIWP 1 will need to be reviewed periodically. The ToC presented during project design (see below) is based on the situation as faced by crop and livestock farmers currently living in the area.



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Annex 3: Project cost and financing: Detailed costs tables

I. Introduction

1. The Annex describes the assumptions underlying the derivation of the project costs and presents summary and detailed cost tables and financing plan. The costing exercise has been carried out using Costab software and is based on costs as of May 2018, during the 1st design mission, and updated after the 2nd design mission in November 2018. Project costs are presented in both Rwandan franc (RWF) and US dollars (US$). The Project input cost are set in US dollars.

II. Main Assumptions for cost estimation

2. **Summary divisions.** The project costs taken into account include investment costs and incremental recurrent costs within the three components: i) Strengthening resilience to droughts; ii) Support to farm business development; and iii) Institutional development and project coordination.

3. **Project Period.** The Project is expected to have a duration of six years, starting in the 3rd quarter of 2019 and finishing in the 3rd quarter of 2025.

4. **Unit costs.** Unit costs are broadly derived from the experience of the on-going IFAD projects in Rwanda, namely the Kirehe Community-based Watershed Management Project (KWAMP), the Project for Rural Income through Exports (PRICE), the Climate Resilient Post-Harvest and Agribusiness Support Project (PASP), and the Rwanda Dairy Development Project (RDDP). The project is to some extent flexible, as based on the participatory approach and the principle of intervention at request, in particular as regards the producer public private partnerships (4Ps). The estimated costs should thus be considered as indicative and mostly presented in terms of financial allocations by component, subcomponent or activity. Even when quantities and unit costs are indicated in the detailed tables, it is above all the overall allocation that should be considered. The detailed planning of activities and their implementation will be in response to requests from target groups and/or after needs assessment

5. **Prices**. Prices are inclusive of all taxes, i.e. including custom duties, Value Added Tax (VAT) and other sales taxes. The tax rates retained are similar to those used for the on-going projects mentioned above, as shown in the table 1 below. Base costs for goods and services purchased locally are derived from local sales prices (market prices), including all taxes as they are real costs for the project. Prices of goods and services are mostly expressed in foreign currency, albeit payable in RWF. Base costs for imported goods include CIF prices, duties, sales taxes and domestic value added, i.e. the costs of local handling, transportation, financial intermediation, margins of various actors in the supply chain, up to the delivery location.

6. **Inflation.** In line with estimates from the International Monetary Fund (IMF)25, the annual local inflation rate has been set at about 5%per year for the whole project period. Foreign inflation was set at 2% per year. The international inflation applied to foreign exchange costs (FE) is based on the forecasted evolution of the Manufactures Unit Value Index during the project implementation period (2% during 2017-2022).

7. **Exchange Rate.** The initial exchange rate for the cost estimate has been set at US$1.00: RWF855, the rate prevailing in May 2018. In light of the past exchange rate movement in Rwanda, it is likely that this rate varies during the life of the project to reflect the significant difference between national and international inflation rates. Therefore, the option of Constant purchasing parity has been used in the absence of reliable exchange rate forecast.

[25] World Economic Outlook 2018, inflation projections until 2022.

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8. **Taxes and Duties**. Taxes apply to all expenditure categories except for Salaries and Allowances, Consultancies, Operating costs, Grants, and Training and Workshops, as specified in table 1 below. All taxes and duties will be waived by the government and accounted for as Government of Rwanda counterpart contribution in COSTAB.

9. **Physical and Price Contingencies.** Physical contingencies are intended for facing up to changes in quantities and/or methods of implementation of the project. They are expressed as a percentage of base costs and are applied on civil works. Based on PRICE experience, the physical contingencies are set to five percent for civil works. Price contingencies are intended for facing up to the effects of inflation and devaluation of the exchange rate between the Rwanda Franc (RWF) and the US dollar (US$). They are computed by Costab based on the rates set forth for the inflation at national and international levels

10. **Expenditure and Disbursement Accounts.** The expenditure categories considered are in accordance with IFAD standardization of expenditures categories based on circular IC/FOD/02/2013. The same categories have been generated for the disbursement accounts.

11. **Foreign exchange.** Foreign exchange represents the direct and indirect imported inputs embodied in the cost. Table 1 below lays out the expenditure's categories and the percentages of physical contingencies, taxes and foreign exchange used, which are mainly derived from on-going IFAD projects in Rwanda.

Table 1: Expenditure Accounts

Description	Foreign Exchange (percent)	Taxes & Duties (percent)	Physical Contingencies (percent)
I. INVESTMENT COSTS			
A. Civil works	50	18	5
B. Consultancies	50	0	0
C. Equipment and Materials	70	20	0
D. Vehicles	70	20	0
E. Training and Workshop	20	0	0
II. RECURRENT COSTS			
A. Salaries & Allowances	30	0	0
B. Operating Cost	30	0	0

III. Project Costs

12. **Total Project Costs for KIIWP 1.** Total project investment and recurrent costs, including physical and price contingencies, are estimated at US$20.93 million (RWF18.7 billion). The foreign exchange component is estimated at US$11.01

million (50% of project cost), while taxes have been calculated at approximately US$1.7 million or 7% of total project costs. Total baseline costs are US$20.03 million, while price contingencies account for US$0.65 million (or 3 % of the base costs) and physical contingencies amount to US$0.25 (or 1 % of the base costs).

13. **Costs by components for KIIWP 1.** The costs broken down by project component is as follows: (i) Strengthening resilience to droughts: US$16.92 million (82%); (ii) Institutional development and project coordination: US$3.1 million (18%). Table 2 to 4 below present a breakdown of the costs by component and sub-component, year and expenditure type. Detailed cost tables and additional summary tables are presented in the excel file.

14. **Anticipated total Project Costs for KIIWP 2.** Total project investment and recurrent costs, including physical and price contingencies, are estimated at US$59.23 million (RWF53.16 billion). The foreign exchange component is estimated at US$26.96 million (46% of project cost), while taxes have been calculated at approximately US$8.7 million or 14.7% of total project costs. Total baseline costs are US$55.47 million, while price contingencies account for US$1.9 million (or 3%of the base costs) and physical contingencies amount to US$1.8 million (or 3% of the base costs).

15. **Costs by components for KIIWP 2.** The costs broken down by project component are as follows: (i) Strengthening resilience to droughts: US$43.9 million (79%); (ii) Support to farm business development: US$7.9 million (14%); (iii) Institutional development and project coordination: US$3.6 million (6%). Table 5 to 7 below present a breakdown of the costs by component and sub-component, year and expenditure type. Detailed cost tables and additional summary tables are presented in the excel file.

Table 2: Project Cost by Component for KIIWP 1

	(RWF Million)			(US$ '000)			% Fore Excha
	Local	Foreign	Total	Local	Foreign	Total	
A. Strengthening resilience to droughts							
1. Catchment rehabilitation and protection structures	2,979.7	3,962.9	6,942.6	3,485.0	4,635.0	8,120.0	
2. Irrigation Development	3,454.2	3,454.2	6,908.4	4,040.0	4,040.0	8,080.0	
3. Infrastructure Management Institutions	157.4	69.0	226.4	184.1	80.7	264.8	
4. Enviromental and Social Management Plan	267.6	126.5	394.2	313.0	148.0	461.0	
Subtotal Strengthening resilience to droughts	6,858.9	7,612.7	14,471.6	8,022.1	8,903.7	16,925.8	
B. Institutional Development and Project Coordination							
1. Institutional Support	153.9	38.5	192.3	180.0	45.0	225.0	
2. Programme Management and Coordination	1,580.0	885.9	2,465.9	1,848.0	1,036.1	2,884.1	
Subtotal Institutional Development and Project Coordination	1,733.9	924.4	2,658.2	2,027.9	1,081.1	3,109.0	
Total BASELINE COSTS	8,592.8	8,537.0	17,129.8	10,050.0	9,984.8	20,034.8	
Physical Contingencies	106.9	106.9	213.8	125.0	125.0	250.0	
Price Contingencies	736.7	683.1	1,419.8	338.6	314.6	653.2	
Total PROJECT COSTS	9,436.3	9,327.0	18,763.3	10,513.7	10,424.4	20,938.0	

Table 3 Project Component by year for KIIWP 1 (US$ 000)

	Base Cost				
	2019	**2020**	**2021**	**2022**	**Total**
A. Strengthening resilience to droughts					
1. Catchment rehabilitation and protection structures	2,400.0	4,370.0	1,350.0	-	8,120.0
2. Irrigation Development	1,120.0	3,660.0	3,300.0	-	8,080.0
3. Infrastructure Management Institutions	113.5	81.7	66.2	3.4	264.8
4. Enviromental and Social Management Plan	-	292.0	169.0	-	461.0
Subtotal Strengthening resilience to droughts	3,633.5	8,403.7	4,885.2	3.4	16,925.8
B. Institutional Development and Project Coordination					
1. Institutional Support	41.3	54.9	68.7	60.2	225.0
2. Programme Management and Coordination	1,057.2	632.0	870.3	324.5	2,884.1
Subtotal Institutional Development and Project Coordination	1,098.5	686.9	939.0	384.7	3,109.0
Total BASELINE COSTS	4,732.0	9,090.6	5,824.2	388.1	20,034.8
Physical Contingencies	67.5	115.0	67.5	-	250.0
Price Contingencies					
Inflation					
Local	51.0	309.5	401.5	52.8	814.8
Foreign	25.2	144.2	137.6	7.5	314.6
Subtotal Inflation	76.3	453.6	539.1	60.4	1,129.4
Devaluation	-28.3	-175.6	-239.8	-32.5	-476.2
Subtotal Price Contingencies	48.0	278.0	299.3	27.9	653.2
Total PROJECT COSTS	4,847.5	9,483.6	6,191.0	415.9	20,938.0
Taxes	557.6	871.1	272.6	-	1,701.2
Foreign Exchange	2,547.7	4,917.4	2,846.7	112.6	10,424.4

Table 4: Expenditure Accounts by Components for KIIWP 1 (US$) - totals including contingencies

	Strengthening resilience to droughts			Institutional Development and Project Coordination			
	Catchment rehabilitation and protection structures	Irrigation Development	Infrastructure Management Institutions	Enviromental and Social Management Plan	Institutional Support	Programme Management and Coordination	C Total
I. Investment Costs							
EQUIPMENT & MATERIALS	3,000.0	-	-	-	-	56.0	3,056.
GOODS & SERVICES & INPUTS	100.0	-	20.7	36.0	-	200.0	356.
WORKS	5,000.0	-	-	-	-	-	5,000.
VEHICLES	-	-	-	-	-	236.4	236.
CONSULTANCIES	20.0	8,080.0	89.0	180.0	-	425.0	8,794.
TRAINING & WORKSHOPS	-	-	155.1	245.0	225.0	210.6	835.
GRANTS & SUBSIDIES	-	-	-	-	-	-	
Total Investment Costs	8,120.0	8,080.0	264.8	461.0	225.0	1,128.0	18,278.
II. Recurrent Costs							
SALARIES & ALLOWANCES	-	-	-	-	-	1,514.2	1,514.
OPERATING COSTS	-	-	-	-	-	241.9	241.
Total Recurrent Costs	-	-	-	-	-	1,756.1	1,756.
Total BASELINE COSTS	8,120.0	8,080.0	264.8	461.0	225.0	2,884.1	20,034.
Physical Contingencies	250.0	-	-	-	-	-	250.
Price Contingencies							
Inflation							
Local	214.0	368.1	13.5	30.1	20.3	168.8	814.
Foreign	129.6	144.7	1.9	5.5	2.0	30.8	314.
Subtotal Inflation	343.7	512.8	15.4	35.6	22.3	199.6	1,129.
Devaluation	-111.5	-223.4	-8.2	-18.2	-12.4	-102.4	-476.
Subtotal Price Contingencies	232.1	289.4	7.2	17.4	9.9	97.2	653.
Total PROJECT COSTS	8,602.1	8,369.4	272.0	478.4	234.8	2,981.3	20,938.
Taxes	1,603.0	-	3.2	5.6	-	89.4	1,701.
Foreign Exchange	4,889.6	4,184.7	82.6	153.5	47.0	1,067.0	10,424.

Table 5: Project Cost by Component for KIIWP 2

	(RWF Million)					(US$ '000)				
	Local	Foreign	Total	% Foreign Exchange	% Total Base Costs	Local	Foreign	Total	% Foreign Exchange	% Total Base Costs
A. Strengthening resilience to droughts										
1. Catchment rehabilitation and protection structures	5,835.4	5,835.4	11,670.8	50	25	6,825.0	6,825.0	13,650.0	50	25
2. Irrigation Development	10,100.2	10,020.5	20,120.7	50	42	11,813.1	11,719.9	23,533.0	50	42
3. Infrastructure Management Institutions	47.3	24.9	72.2	34	-	55.3	29.1	84.4	34	-
4. Enhancing climate smart agriculture practices and technologies	2,830.7	1,278.7	4,109.3	31	9	3,310.7	1,495.5	4,806.2	31	9
5. Environmental and Social Management Plan	1,122.8	466.6	1,589.4	29	3	1,313.3	545.8	1,859.0	29	3
Subtotal Strengthening resilience to droughts	19,936.4	17,626.0	37,562.4	47	79	23,317.4	20,615.2	43,932.6	47	79
B. Support to farm business development										
1. Developing Farming as a Business skills	519.9	163.3	683.2	24	1	608.0	191.0	799.0	24	1
2. Promotion of mechanization, post-harvest storage and irrigation technologies	1,249.1	2,428.4	3,677.4	66	8	1,460.9	2,840.2	4,301.1	66	8
3. Supporting backward and forward linkages	2,050.8	376.7	2,427.5	16	5	2,398.6	440.6	2,839.2	16	5
Subtotal Support to farm business development	3,819.7	2,968.4	6,788.1	44	14	4,467.5	3,471.8	7,939.3	44	14
C. Institutional Development and Project Coordination										
1. Institutional Support	50.6	12.6	63.2	20	-	59.2	14.8	74.0	20	-
2. Program Management and Coordination	2,091.1	926.3	3,017.4	31	6	2,445.7	1,083.3	3,529.1	31	6
Subtotal Institutional Development and Project Coordination	2,141.7	938.9	3,080.6	30	6	2,504.9	1,098.1	3,603.0	30	6
Total BASELINE COSTS	25,897.8	21,533.3	47,431.1	45	100	30,289.8	25,185.2	55,475.0	45	100
Physical Contingencies	789.8	789.8	1,579.6	50	3	923.8	923.8	1,847.5	50	3
Price Contingencies	2,298.4	1,854.2	4,152.6	45	9	1,055.1	852.5	1,907.5	45	3
Total PROJECT COSTS	28,986.0	24,177.4	53,163.3	45	112	32,268.6	26,961.4	59,230.0	46	107

Table 6: Project Component by year for KIIWP 2 (US$ 000)

	2022	2023	2024	2025	Total
A. Strengthening resilience to droughts					
1. Catchment rehabilitation and protection structures	4,050.0	4,650.0	4,950.0	-	13,650.0
2. Irrigation Development	4,660.0	13,980.0	4,660.0	233.0	23,533.0
3. Infrastructure Management Institutions	31.8	34.8	12.4	5.4	84.4
4. Enhancing climate smart agriculture practices and technologies	978.1	1,294.6	1,478.6	1,055.1	4,806.2
5. Enviromental and Social Management Plan	609.0	864.0	371.0	15.0	1,859.0
Subtotal Strengthening resilience to droughts	10,328.9	20,823.4	11,472.0	1,308.5	43,932.6
B. Support to farm business development					
1. Developing Farming as a Business skills	213.8	215.8	208.8	160.8	799.0
2. Promotion of mechanisation, post-harvest storage and irrigation technologies	783.1	1,563.5	1,547.1	407.5	4,301.1
3. Supporting backward and forward linkages	724.6	892.6	636.0	586.0	2,839.2
Subtotal Support to farm business development	1,721.4	2,671.8	2,391.9	1,154.3	7,939.3
C. Institutional Development and Project Coordination					
1. Institutional Support	58.2	15.8	-	-	74.0
2. Program Management and Coordination	853.3	1,029.0	931.3	715.5	3,529.1
Subtotal Institutional Development and Project Coordination	911.4	1,044.8	931.3	715.5	3,603.0
Total BASELINE COSTS	12,961.7	24,540.0	14,795.1	3,178.2	55,475.0
Physical Contingencies	435.5	931.5	480.5	-	1,847.5
Price Contingencies	134.0	769.2	776.1	228.3	1,907.5
Total PROJECT COSTS	13,531.2	26,240.7	16,051.7	3,406.5	59,230.0

Table 7: Expenditure Accounts by Components for KIIWP 2 (US$) - totals including contingencies

	Strengthening resilience to droughts					Support to farm business development			Institutional Development and Project Coordiation		
	1.1	1.2	1.3	1.4	1.5	2.1	2.2	2.3	3.1	3.2	Total
I. Investment Costs											
EQUIPMENT & MATERIALS	-	-	-	360.0	-	-	3,940.0	-	-	-	4,300.0
GOODS & SERVICES & INPUTS	-	-	12.7	1,741.0	911.0	386.0	120.0	1,058.0	-	-	4,228.7
WORKS	13,650.0	23,300.0	-	-	-	-	-	-	-	-	36,950.0
VEHICLES	-	-	-	-	-	-	-	-	-	-	-
CONSULTANCIES	-	-	38.5	850.0	428.0	-	10.0	-	-	175.0	1,501.5
TRAINING & WORKSHOPS	-	-	33.2	1,733.0	520.0	294.0	49.0	582.2	74.0	103.8	3,389.2
GRANTS & SUBSIDIES	-	-	-	-	-	-	57.5	1,000.0	-	-	1,057.5
Total Investment Costs	13,650.0	23,300.0	84.4	4,684.0	1,859.0	680.0	4,176.5	2,640.2	74.0	278.8	51,426.9
II. Recurrent Costs											
SALARIES & ALLOWANCES	-	-	-	95.0	-	103.7	-	199.0	-	3,020.0	3,417.7
OPERATING COSTS	-	233.0	-	27.2	-	15.4	124.6	-	-	230.3	630.5
Total Recurrent Costs	-	233.0	-	122.2	-	119.0	124.6	199.0	-	3,250.3	4,048.1
	13,650.0	23,533.0	84.4	4,806.2	1,859.0	799.0	4,301.1	2,839.2	74.0	3,529.1	55,475.0
Physical Contingencies	682.5	1,165.0	-	-	-	-	-	-	-	-	1,847.5
Price Contingencies	454.0	757.6	2.4	199.8	52.1	30.8	162.9	108.6	1.1	138.3	1,907.5
TOTAL PROJECT COSTS	14,786.5	25,455.6	86.8	5,006.0	1,911.1	829.8	4,464.0	2,947.8	75.0	3,667.4	59,230.0

IV. Financing Plan

16. **Financing Plan for KIIWP I.** KIIWP I will be financed by: (i) IFAD up to US$17.79 million (85%), through a highly concessional loan; (ii) Government of Rwanda for a total of US$2.83 million (13.5%) in the form of tax exemptions; (iii) DFID for a total of US$0.3 million (6.5%) in the form of consultancies for Ndego irrigation system[26]. Details of financing arrangements by components are shown in table 8 and by expenditure category in table 9.

17. **Anticipated Financing Plan for KIIWP 2.** The project will be financed by: (i) IFAD up to US$25.7 million (43.4%), through a highly concessional loan; (ii) Private sector for US$322 thousand (0.5%); (iii) ICCO for US$246 thousand (0.3%), (iv) Government of Rwanda for a total of US$8.8 million (15%) in the form of tax exemptions; (v) Co-financiers for a total of US$22 million (37.3%); and (vi) Beneficiaries for US$2 million (3.4%). Please see annex 12 for more details.

[26] Feasibility and design study and full ESIA study.

Table 8: Financing Plan by Components for KIIWP 1 (US$ 000)

	IFAD		The Government		DFID		Total			Local (Excl.
	Amount	%	Amount	%	Amount	%	Amount	%	For. Exch.	Taxes
A. Strengthening resilience to droughts										
1. Catchment rehabilitation and protection structures	6,999.1	81.4	1,603.0	18.6	-	-	8,602.1	41.1	4,889.6	2,109.
2. Irrigation Development	6,929.1	82.8	1,131.2	13.5	309.1	3.7	8,369.4	40.0	4,184.7	4,184.
3. Infrastructure Management Institutions	268.8	98.8	3.2	1.2	-	-	272.0	1.3	82.6	186.
4. Enviromental and Social Management Plan	472.8	98.8	5.6	1.2	-	-	478.4	2.3	153.5	319.
Subtotal Strengthening resilience to droughts	14,669.8	82.8	2,743.1	15.5	309.1	1.7	17,721.9	84.6	9,310.4	6,799.
B. Institutional Development and Project Coordination										
1. Institutional Support	234.8	100.0	0.0	0.0	-	-	234.8	1.1	47.0	187.
2. Programme Management and Coordination	2,891.9	97.0	89.4	3.0	-	-	2,981.3	14.2	1,067.0	1,824.
Subtotal Institutional Development and Project Coordination	3,126.7	97.2	89.4	2.8	-	-	3,216.1	15.4	1,113.9	2,012.
Total PROJECT COSTS	17,796.5	85.0	2832.4	13.5	309.1	1.5	20,938.0	100.0	10,424.4	8,812.

Table 9: Expenditure Accounts by Financier for KIIWP 1 (US$ 000)

	IFAD		The Government		DFID		Total			Local (Excl.	Duties &
	Amount	%	Amount	%	Amount	%	Amount	%	For. Exch.	Taxes)	Taxes
I. Investment Costs											
EQUIPMENT & MATERIALS	2,501.6	80.0	625.4	20.0	-	-	3,127.0	14.9	2,188.9	312.7	625.4
GOODS & SERVICES & INPUTS	308.5	85.0	54.4	15.0	-	-	362.9	1.7	90.7	217.7	54.4
WORKS	4,435.5	82.0	973.6	18.0	-	-	5,409.1	25.8	2,704.6	1,730.9	973.6
VEHICLES	191.0	80.0	47.8	20.0	-	-	238.8	1.1	167.1	23.9	47.8
CONSULTANCIES	7,658.9	84.2	1,131.2	12.4	309.1	3.4	9,099.2	43.5	4,549.6	4,549.6	-
TRAINING & WORKSHOPS	868.6	100.0	0.0	-	-	-	868.6	4.1	173.7	694.8	-
GRANTS & SUBSIDIES	-	-	-	-	-	-	-	-	-	-	-
Total Investment Costs	15,964.0	83.6	2,832.4	14.8	309.1	1.6	19,105.5	91.2	9,874.6	7,529.7	1,701.2
II. Recurrent Costs											
SALARIES & ALLOWANCES	1,580.6	100.0	0.0	-	-	-	1,580.6	7.5	474.2	1,106.4	-
OPERATING COSTS	251.9	100.0	0.0	-	-	-	251.9	1.2	75.6	176.3	-
Total Recurrent Costs	1,832.5	100.0	0.0	-	-	-	1,832.5	8.8	549.8	1,282.8	-
Total PROJECT COSTS	17,796.5	85.0	2,832.4	13.5	309.1	1.5	20,938.0	100.0	10,424.4	8,812.4	1,701.2

Annex 4: Economic and Financial Analysis

Introduction

18. This Annex lays out the methodology, assumptions and results of the economic and financial analysis carried out to assess the impact and viability of the Kayonza Irrigation and Integrated Watershed Management Project Phase I (KIIWP 1). The aim is to identify, calculate and compare project costs and benefits and thereby assess its viability, first from the point of view of individual participants in the project (financial analysis) and then from the standpoint of the national economy as a whole (economic analysis).

Project benefits and beneficiaries

19. **Benefits**. KIIWP 1's development objective is to improve food security and incomes of rural households on a sustainable basis. Project interventions are expected to result in an extensive range of tangible and intangible benefits. Key quantifiable benefits include: i) crop diversification and increased value of production in hillside areas; ii) increased value of livestock production; iii) improved access to water for domestic uses. These benefits will be achieved through project interventions such as: i) water infrastructure development; ii) promotion of climate smart agriculture and land husbandry practices; iii) promotion of sustainable land and water management practices.

20. **Beneficiaries**. The project will be implemented in eight drought prone sectors of Kayonza District. It is anticipated that the total number of households benefiting directly from KIIWP 1 during will be 6,500, of which 50% of beneficiaries will be women. Farmers and rural households in the project area will also benefit indirectly from project activities through increased demand for farm labour, clustering and value chain linkages and nutrition-related outcomes. Table 1 below provides an overview of direct project beneficiaries form different interventions in the project lifespan.

21. **Adoption rates.** This analysis uses the total number of direct beneficiaries and estimates that 77% of farm-enterprises and 76% of non-farm enterprises will adopt the project interventions and activities. These adoption rates are reflected in Table 1.

Table 1: Number of households benefiting directly from KIIWP 1 activities

Number of direct beneficiaries			**Phasing per Calendar Year**				
Target groups		target HH	**Y 1**	**Y 2**	**Y 3**	**Y4**	**Total**
Farm- enterprises	***target***	***4000***					
adoption rate		76%	0%	30%	40%	30%	
no. of HH	100%	**3040**					
Hillside farms	100%	3040	0	912	1216	912	**3040**
cumulative no. of HH		3040	0	912	2128	3040	**3040**
Non-Farm- enterprises	***target***	***2500***					
adoption rate		77%	0%	43%	57%	0%	
no. of HH	100%	**1928**					
Livestock and domestic	100%	1928	-	829	1,099	-	**1928**
cumulative no. of HH		1928	-	829	1,928	1,928	1928
Total Project Target HHs	***target***	***6500***	-	1,741	4,056	4,056	
Total beneficiaries in project supported HH		*29,250*	-	*7,834*	*18,250*		
persons per HH	4.5						

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Financial Analysis

22. **Methodology.** The methodology follows recent IFAD guidelines on Economic and Financial Analysis (EFA)[27] that recommend the use of cost-benefit analysis which is based in the valuation in monetary terms of project cost and benefits. The financial analysis is only applied to the project activities that lend themselves to it and where sufficient data are available. The analysis builds on primary and secondary data collected by the design team during the first design mission in April/May 2018. Information was obtained through field visits, interviews with government officials, farmers groups and stakeholders as well as from other on-going IFAD projects (e.g. KWAMP, PASP, PRICE, RDDP) and World Bank Projects (LWH, RSSP) in the country. Conservative assumptions were made both for inputs and outputs.

23. The financial analysis has been undertaken from the point of view of a rural household engaged in agricultural production and livestock (dairy) management activities. The analysis aims first at assessing the financial profitability of representative production models. It should be noted that the financial models have been developed solely for the purpose of the EFA analysis, as in practice farm's characteristics usually change from one place to another.

24. **Financial models** A total of eight crop budgets have been prepared to assess farm productivity, gross margins and returns to labour for rice, maize, beans, eggplant, green pepper, onion and tomato. Furthermore, livestock models for cows were also prepared. The incremental benefits have been estimated as the difference between a "without project (WoP)" and a "with project (WP)" scenario.

25. **Crop budgets**. The "WoP" is characterized by traditional subsistence farming with low yields, low technology adoption and high post-harvest loss rates. Besides, farmers face particular difficulties in marketing like production planning, bulking, transport, steady flow of marketable produce and buyer identification and negotiations.

26. In the "WP", farmers are expected to increase productivity (including more production cycles) and decrease post-harvest losses, due to trainings in Good Agricultural Practices (GAP), producer coaching, introduction of irrigation, connection to markets. Furthermore, the farmers are assisted in gradually transforming their crops from traditional staple crops to higher value cash crops. The adoption of good agricultural practices involves also the sustainable management of land and water.

27. Revenues are formed of agro-products sales and operational costs are mainly seeds, fertilizers, chemicals and labour. Investments are mainly in small scale irrigation technologies[28]. Several aspects have been included in the crop budget analysis:

    (a) Labour is a combination between family and hired. The hired labor has been valued at RWF1000 per day. For unpaid family labor a daily rate of RWF750 is used as the financial cost[29].

    (b) Home consumption for maize, beans and rice is estimated in the models to assess the impact on food security and marketable surplus to the beneficiaries. Agriculture production used for self-consumption is not valued in monetary terms.

27 IFAD's Internal Guidelines for Economic and Financial Analysis of Rural Investment Projects

28 The investment cost in SSIT is subsidized at 50%.

29 The calculation of family labor wage rate is based on World Bank (2014) Transformation of Agriculture Sector Program Phase 3.

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(c) Prices reflect those actually paid at farmgate. It is also assumed that market demand is healthy for all analysed crops and that all marketable surplus from local producers can be readily absorbed in the main markets without adverse effects on the market price.

(d) It is assumed that productivity increases related to yield improvement and reduced post-harvest losses will happen gradually, reaching its full value at the end of the project.

28. Maize, beans, and rice budgets have been developed to represent the current situation in the field. Table 2 shows post-harvest yields, self-consumption, total revenues, total operating costs, net income and the return to labour for the crops considered. The data presented are for 1-hectare representative cultivation area. Assumption on productivity increase are based on results from KWAMP[30], WB PAD document for the Transformation of the Agriculture Sector Program Phase 3, and data from RAB. The with-project information presents data for the project once it has reached its full development in year 5. Data for rice is presented for one growing season. This crop is normally grown for two seasons within a year. The negative values of net income under the WOP scenarios for maize and beans stem from the valuation of the financial costs of family labor[31]. Existing average yields are also quite low given the rainfed and poor management conditions under which these two crops are grown.

29. Table 3 presents similar information for the remaining crops budgets (vegetables), which are part of the focus commodities short-listed for this project. Estimates are deliberately conservative to ensure that the economic and financial model is robust. Most of these crops are grown in very limited amounts due to the existing farmer's orientation to staple crops.

30 See KWAMP impact assessment: IOE 2019 KWAMP PPE.
31 Furthermore, self-consumption has not been valued in monetary terms.

Table 2 Main indicators from crop budgets: maize and beans.

		Maize			Beans		
Crops budgets- per ha	Unit	WoP	Wp*	Incremental	WoP	Wp*	Incremental
Post-harvest yield	kg	1,275	4,140	225%	600	2,250	275%
Self-consumption	kg	250	500	100%	250	400	60%
Total Revenues	'000 RWF	255	828	225%	112	592	429%
Total Operating Costs	'000 RWF	399	607	52%	402	584	45%
Net Income	'000 RWF	(144)	220	253%	(290)	7,2	102%
Return to Labour	RWF/p-d	-	802	n/a	-	25	n/a

*Values at full development

Table 3 Main indicators from crop budgets: vegetables.

		Tomato			Onion			Green Pepper			Eggplant		
Crops budgets- per ha	Unit	WoP	Wp*	Increm.	WoP	Wp*	Increm.	WoP	Wp*	Increm.	WoP	Wp*	Increm.
Post-harvest yield	ton/ha	11.25	13.5	20%	11.25	13.5	20%	9.0	10.8	20%	11.25	13.5	20%
Self-consumption	kg	-	-	n/a	-	-	n/a	-	-	n/a	-	-	n/a
Total Revenues	'000 RWF	3,375	4,050	20%	4,500	5,400	20%	4,500	5,400	20%	2,813	3,375	20%
Total Operating Costs	'000 RWF	1,689	1,689	0%	1,606	1,606	0%	1,246	1,246	0%	1,236	1,236	0%
Net Income	'000 RWF	1,686	2,361	40%	2,894	3,794	31%	3,254	4,154	28%	1,576	2,139	36%
Return to Labour	RWF/p-d	3088	4325	40%	4729	6200	31%	8301	10597	28%	4021	5456	36%

* Values at full development

30. **Farm Models.** On the basis of the above listed crop budgets, the existing growing conditions and production arrangements in the country, a farm enterprise model, with an average land of 0.3 hectares, has been developed for hillside farms:

In the WOP situation, farmers grow mainly traditional maize, beans and a very small area of vegetables. This farming is highly dependent on rain and subject to soil erosion, resulting in low crop yields. Interventions promoted such as the terracing, water storage and the promotion of best agricultural practices will have an impact both on crop yields and the cropping patterns. The WP situation establishes a decreasing allocation of land for maize and beans and an increased cultivation of vegetables. It is expected that about 3,040 households cultivating in hillsides will benefit from the project, based on a 76% adoption rate.

31. A summary of the crop pattern for each farm model is presented in Table 4, below.

Table 4 Assumed Representative Farm Cropping Pattern Without- and With Program

Hillside- Representative Farm				
Share of farm area	**WOP**		**WP**	
	%	**ha**	**%**	**ha**
Maize	65%	0.195	43%	0.129
Beans	31%	0.093	10%	0.030
Eggplant	1%	0.003	10%	0.030
Green pepper	1%	0.003	15%	0.045
Onion	1%	0.003	12%	0.036
Tomato	1%	0.003	10%	0.030
Total	**100%**	**0.30**	**100%**	**0.30**

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32. **Financial model results**. A financial discount rate of 17% was used based on the actual lending rates of commercial banks[32]. The model shows negative net present value (NPV) and a financial internal rate of return (FIRR) of 9.2%. Table 5 presents the expected financial benefits. Indicators selected include net income at full development after labour, FIRR and NPV. It is understood that such net incomes may not be achieved in one year; thus a gradual and conservative achievement of the expected benefits has been used in the analysis. Hillside farms have a small negative net income in the WOP situation which stems from the inclusion of family labour costs of producing low return crops such as maize and beans. Results suggest a move to producing less traditional crops, especially maize and beans with a low net income to more profitable and higher value vegetable crops, which can have a significant positive impact on Farm HHs.

Table 5: Farm Models financial results.

Farm enterprise type	**Net income (RWF) after labour**			**NPV (RWF) @17%**	**NPV (USD)33 @17%**	**FIRR**
	WOP	*WP[1]*	*Increm.*			
Hillside Farm	(19,429.8)	378,216	2047%	($480,003)	($561)	9.22%

32 National Bank of Rwanda (2018). Commercial Bank lending rates in 2017.
33 Exchange rate used is 1USD-855RwF, based on National Bank or Rwanda, May 2018.

33. **Livestock model**. The project does not invest directly in livestock production activities. The major constrains hampering the development of this activity in the Kayonza District is the lack of water, which affects also the availability of enough quantity and quality of pastures. However, the project does involve the construction of boreholes, which will improve access to water for livestock. Greater water availability is expected to increase the existing low productivity of cows. The financial analysis considers the benefits associated with milk productivity increases for cows. In the WOP situation, cows exhibit low milk production. Households are also assumed to make limited use of inputs given the existing low returns. The WP situation represents a gradual increase in milk productivity accompanied with greater input uses. It is expected that about 1,928 households will benefit from the project, based on a 77% adoption rate. Table 6 shows milk production yields, self-consumption, total revenues, total operating costs, net income and the return to labour for the crops considered. The data presented are for 1-hectare representative area. The with-project information presents data for the project once it has reached its full development in year 5. From the estimation of the livestock model, the additional value of milk production associated with the project amounts to RWF230,550 per year and a net present value of US$898, assuming a 10 year period of benefit stream and a 17% discount rate[34].

Table 6: Financial results for livestock enterprise models

		Livestock		
Livestock budgets- per ha	Unit	WoP	Wp*	Incremental
Milk production	liters	1,450	2,900	100%
Self-consumption	liters	435	870	100%
Total Revenues	RWF	230,550	461,100	100%
Total Operating and Labor Costs	RWF	133,500	231,500	73%
Net Income	RWF	97,050	229,600	137%
Return to Labour	RWF/p-d	1078.3	2551.1	137%
NPV @ 17%	RWF	-	767,384	
NPV @ 17%	USD	-	898	

34. **Improved access to water**. The construction of boreholes by the project will save rural households from fetching water at a distance, even during the dry season. This time saved can now be used for other activities. On average, households use eight jerricans of water (20 liter-jerricans) each day for domestic purposes. They normally fetch from streams or other distant boreholes. The time spent while going to fetch the water was estimated at 60 minutes. One person would only carry one jerrican at a time. Thus, each household on average requires 480 minutes to fetch water daily, i.e., eight hours. This can be value according to the wage rate of RWF1,000. An additional RWF80 must be added to incorporate the price of borehole water (sold at RWF10 per jerrican). Overall, this translates to RWF394,200 of benefits per year per household and a net present value of US$2,148, assuming a 10-year period of benefit stream and a 17% discount rate[35]. It is expected that about 1,928 households will benefit from the project, based on a 77% adoption rate.

34 No FIRR has been calculated since households will not bear the costs of borehole construction.
35 No FIRR has been calculated since households will not bear the costs of borehole construction.

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Economic Analysis

35. The economic analysis aims to assess the viability of the proposed project from the standpoint of the society as a whole. It is based on the aggregation of individual incremental net benefits calculated through the models developed in the financial analysis, subject to adjustments highlighted hereafter and in accordance with the targets set in the logical framework.

Methodology and assumptions

36. The economic analysis is predicated on the comparison of the with-project situation to the without-project situation to measure the incremental benefits arising from the project. The methodology used is the cost-benefit analysis at shadow prices that better reflect the economic value to society of goods and services, often referred to as "economic opportunity costs" or "social opportunity costs". The analysis has been carried out for a 30-year period, corresponding to the likely life period of the benefits expected from the major infrastructure investments of the project. The scenario presented in the economic analysis is conservative, the analysis presented below is indicative and demonstrates the scope of profitability originated from the conditions prevailing at the time of the preparation.

37. **Discount rate.** In keeping with IFAD guidelines, a 12% discount rate has been used to reflect the social opportunity cost of capital in Rwanda. This rate corresponds to the yield on the five-year government bonds in 2017 (National Bank of Rwanda)[36].

38. **Standard conversion factor**. The analysis has been done in domestic currency at domestic price level. A shadow exchange rate of RWF788 for US$1 has been used to reflect the opportunity cost of foreign exchange to the country. It has been calculated on the basis of data from the World Bank (WITS)[37] according to the following formula:

$$SER = OER \times \{[(M+TM)+(X-TX)]M+X\} = OER\ x\ SCF$$

SCF= SER/OER
where SER: Shadow Exchange rate
OER: Official Exchange rate
M: Total imports (an average of five years would be advisable)
X: Total Exports (an average of five years would be advisable)
TM: Duties on Imports
TX: Export Taxes
SCF: Standard Conversion Factor

39. The financial prices and the streams of costs and benefits have been converted into economic values, by removing taxes, subsidies and other transfers. A standard conversion factor of 0.92 has been calculated according to the formula above, to all traded goods and services; for the non-tradable goods the conversion factor applied is equal to 1. The economic prices of hired labour costs were adjusted based on conversion factor of 0.8 to account for the unemployment rate in rural areas[38]. For equipment, a conversion factor of 0.8 has also been retained to take into account taxes embodied in the financial prices. All models are expressed in 2018 constant prices. The analysis builds on primary data collected by the design team during the first design mission in April/May 2018, provided by the Government of Rwanda and derived from other on-going IFAD projects (e.g. KWAMP, PASP, PRICE, RDDP) and World Bank Projects (LWH, RSSP) in the country. Conservative assumptions and

36 National Bank of Rwanda (2018) Interest rate structure year 2017. Kigali.
37 https://wits.worldbank.org/CountryProfile/en/Country/RWA/Year/LTST/Summary
38 Source: Labour Force Survey 2016 Report, National Institute of Statistics of Rwanda.

parameters have been applied, in order to avoid over-estimation of benefits and provide realistic results.

Economic costs and benefits

40. The project economic costs have been generated with Costab software which deducts the amounts pertaining to taxes and provisions for price contingencies from the financial costs and applies the shadow exchange rate to convert the cost portion in foreign exchange into local currency. Project costs related to the benefits identified were accounted for[39]. However, in order to avoid double counting, the amounts regarding the investments already taken into account in the financial models have been deducted from the total project cost. The deduction was made directly in the Costab before computing the economic costs

41. The economic benefits accounted for in the calculation of economic profitability indicators are those that are readily quantifiable, deriving from increased value of agricultural production, increased production of milk, and the value of improved access to water for domestic uses.

42. The models developed in the financial analysis have been transformed into economic values using economic prices instead of financial prices as stated above. The total incremental economic benefits for each model have then been computed by multiplying the individual incremental economic benefits to the number of beneficiaries that are expected to adopt the improved practices proposed by the project. To take into account the fact that adoption of new practices and infrastructure construction is likely to be gradual the following cumulative adoption rates have been assumed.

Table 7 Expected cumulative adoption rates.

	Phasing per Calendar Year			
	Y 1	**Y 2**	**Y 3**	**Y 4**
Farm- enterprises	0%	30%	70%	100%
Livestock and domestic	0%	43%	100%	100%

43. The total project incremental benefits have then been calculated by summing up the aggregate incremental economic benefit pertaining to each model. Finally, the stream of economic costs (computed using Costab) have been deducted from the stream of total incremental economic benefits to get the stream of net incremental benefits, so as to compute the economic IRR and NPV.

Economic results and sensitivity analysis

44. **Net Present Value (NPV) and Economic Internal Rate of Return (EIRR).** The net present value of the project over a 30-year period is calculated to be 1,036 (US$ 000) at an economic discount rate of 12% and the economic internal rate of return is estimated to be 15.06%. The summary of the economic analysis is presented in table 9 in this annex. The Project is therefore profitable from an economic standpoint. This result is quite satisfactory, especially as some benefits have not even been taken into account in the calculations due to data shortages. These include the improvement of living conditions and nutrition, the positive spill-over effects of capacity building on the

39 Costs related to the financing of feasibility studies and environmental and social management plans for future irrigation investments were not considered in the analysis.

local economy (suppliers of inputs, equipment, services), especially for women and youth.

45. **Sensitivity analysis:** A sensitivity analysis was conducted to assess the changes in NPV and EIRR due to variations in the future stream of benefits and costs, and delay in project implementation. The Project remains profitable under a range of project scenarios. Switch values for the reduction in benefits and increase in costs are 18% and 21% respectively. Table 8 presents the sensitivity analysis results.

Table 8: Sensitivity analysis results

		ERR	NPV
Base scenario		15.1%	2,112
Project benefits	-10%	13.3%	901
Project benefits	-20%	11.5%	-310
Project benefits	-50%	5.8%	-3,944
Switch value	-18%		
Project costs	10%	13.5%	1,112
Project costs	20%	12.1%	112
Project costs	50%	9.1%	-2,888
Switch value	21%		
1 year lag in ben.		13.0%	758
2 years lag in ben.		11.5%	-452

62

Table 9: Economic analysis (USD)

Project Economic Analysis - Full Project Cost

(constant 2018 values)

(US$ 000)	PY1	PY2	PY3	PY4	PY5	PY6	PY7	PY8	PY9	PY10	…	PY30
Total Program Net Benefits	-	686	1,594	1,614	1,699	1,826	1,906	1,906	1,906	1,906	…	1,906
											…	
Program Costs											…	
Investment Costs	2,981	4,468	2,177	365	-	-	-	-	-	-	…	-
Recurrent Costs	160	520	670	977	68	68	68	68	68	68	…	68
Total Program Costs	3,140	4,988	2,847	1,343	68	68	68	68	68	68	…	68
Total Project Incremental Net Benefits	(3,140)	(4,302)	(1,253)	271	1,631	1,758	1,838	1,838	1,838	1,838	…	1,906
EIRR	**15.06%**											
NPV @12% (USD 000)	1,036											

Further details are provided in the excel file KIIWP_1_EFA_020819. See also Annex 12 for overall eeconomic and financial analysis for KIIWP1 and KIIWP2.

Annex 5: Social Environment and Climate Assessment (SECAP) Review Note

Major landscape characteristics and Issues (Social, natural resources, and climate)

Socio-cultural context

1. Post conflict recovery efforts included infrastructure repairs, community level reconciliation initiatives as well as resettlement of Rwandan refugees and displaced populations. Due to land shortages and population density, most returnees from Tanzania and Uganda settled in the Eastern province and were relocated in an area covering the entire Mutura Game Reserve and their resettlement eventually led to the de-gazettement of two thirds of the Akagera National Park located in Nyagatare and Kayonza districts (UNEP, 2011)[40]. Hence, the land was segmented into ranches and converted into pastureland, ranging from 0.45 ha to 80 ha (UNEP, 2011).

2. About 55% of the population of Kayonza District are aged 19 years or younger. People aged 65 years and above make up 3%. About 52% of the population is female and the majority of this population group is young, with about 83% still under 40 years of age.

3. Youth face several challenges which preclude them from being involved in agriculture including: they do not own land, and therefore do not have access to finance/investment, nor can they lease land; agriculture is practised by youth who did not go to school - educated youth do not want to work in the fields, and wait for other jobs; intellectual property is not valued as a contribution in agricultural projects, so youth do not feel there are opportunities in the sector in which they can excel.

4. The percentage distribution of employment by gender in Kayonza District, shows that the majority of females in Kayonza District are small-scale farmer workers (78%), followed by wage farmer and independent non-farmer workers (both at 6%). Five per cent of females are wage non-farmer workers. Males are also involved in small-scale farm work at a lower percentage than females (61%). Males are wage non-farm workers and independent non-farmers in greater proportions than females, however (18% and 13% respectively).

5. Though not particular to Kayonza District, key gender gaps that require to be addressed include: (i) granting women equal access to productive resources and income generating activities; (ii) including the interests of women in capacity building opportunities and knowledge management under the project; and (iii) giving women equal representation in decision making and institutions.

6. With an average of 179 inhabitants per kilometre square, the population density in Kayonza District is lower than the national average of 483 inhabitants/km^2 (WB, 2017). However, the district presents disparities across sectors with highest density found in Kabarondo (559 inhabitants/km^2) and Kabare (311 inhabitants/km^2) while the least populated areas are Mwiri (45 inhabitants/km^2) and Murundi (73 inhabitants/km^2). The last two sectors are located in the cattle corridor typified by livestock keeping as the main livelihood. After Nyagatare, Kayonza is the second district with the largest rangeland amounting to 46,806.1 ha out of 114,290.4 ha of arable land in the district (NISR, SAS 2017).

7. The Kayonza District Potentialities Report highlights (2013) that land uses comprise agricultural activities, livestock production, fishing and forestry. It also stated that 46.4% of households are cultivating areas under 0.3 ha land. Yet, the Food and Agriculture Organisation (FAO) estimates that, a Rwandan household, with an

[40] UNEP, 2011, Rwanda from post-conflict to environmentally sustainable development, Kenya.

average of 4.3 members, ideally requires at least 0.9 ha to conduct sustainable agriculture and without having to take a job off-farm (NISR[41], 2012; WB, 2016).

8. According to the World Food Programme (WFP) 2015 Comprehensive Food Security and Vulnerability Analysis, in Kayonza District only 46% of the households are food secure, 43% are marginally food secure, 10% are moderately food insecure and 1% are severely food insecure. In addition, households which are most commonly affected by droughts (with more than 80% of livelihoods likely to be affected) are found in Kayonza and Nyagatare districts in the Eastern province.

9. In terms of poverty, the overall distribution of the KIIWP potential beneficiaries in eight drought prone sectors by wealth category shows a higher percentage of people in Category 1 and 2 (49%) than the four other sectors (44%), Kayonza District as a whole (47%) and the national distribution (43.9%). Three sectors show lower percentages for Category 1 and 2, these are Ndego, Rwinkwavu and Kabare. The poorest sectors are Murama, Gahini and Mwiri. In the eight sectors of Kayonza District there are 31% female -headed households, which is higher than the national average. Some sectors have a very high percentage of FHH, such as Murama (48%) and Kabarondo (32%).

10. In the Table below, several indicators show that malnutrition is evident in Kayonza District. The Comprehensive Food Security and Vulnerability Analysis (CFSVA[42]) report in Rwanda found that levels of stunting among children aged under five dropped to 36.7% in 2015, down from 43% at the time of the last analysis in 2012. Stunting at 42.4% is slightly more than 5% higher than the national average.

Table 1: Nutrition indicators

NO	INDICATOR	%
1	Stunting	42.4
2	Prevalence of underweight among children under 5 years (0-59 months)	9.1
3	Prevalence of wasting among children under 5 years (0-59 months)	2
4	Prevalence of anemia among children aged 6-59 months	Moderate: 19.9, Severe: 2
5	Prevalence of anemia among women of reproductive age (15-49 years)	Moderate: 2.6, Severe: 0.5

Natural resources and Natural Resource Management

11. Kayonza District hosts a considerable part of the biodiversity of the Eastern Province, including half of Akagera National Park, vast swamps and a dense hydrographical network composed of a multitude of small interior lakes and Lake Muhazi that Kayonza shares with neighbouring districts. All the lakes are interconnected with the Kagera River by means of creeks and barely accessible marshlands (RNRA, 2015)[43].

12. The wildlife in the Akagera National Park comprises more than 90 species of mammals, 530 bird species and 35 fish species (REMA, 2009[44]). It is reported that the most threatened species are rhinoceros, large carnivores, particularly lions.

13. Rwanda is located in two major basins, Nile and Congo basins, and its hydrological network is composed of nine catchments. Kayonza District is embedded in three

[41] National Institute of Statistics of Rwanda (2012c) EICV3 Thematic Report: Environment and Natural Resources. Kigali: Repubic of Rwanda.

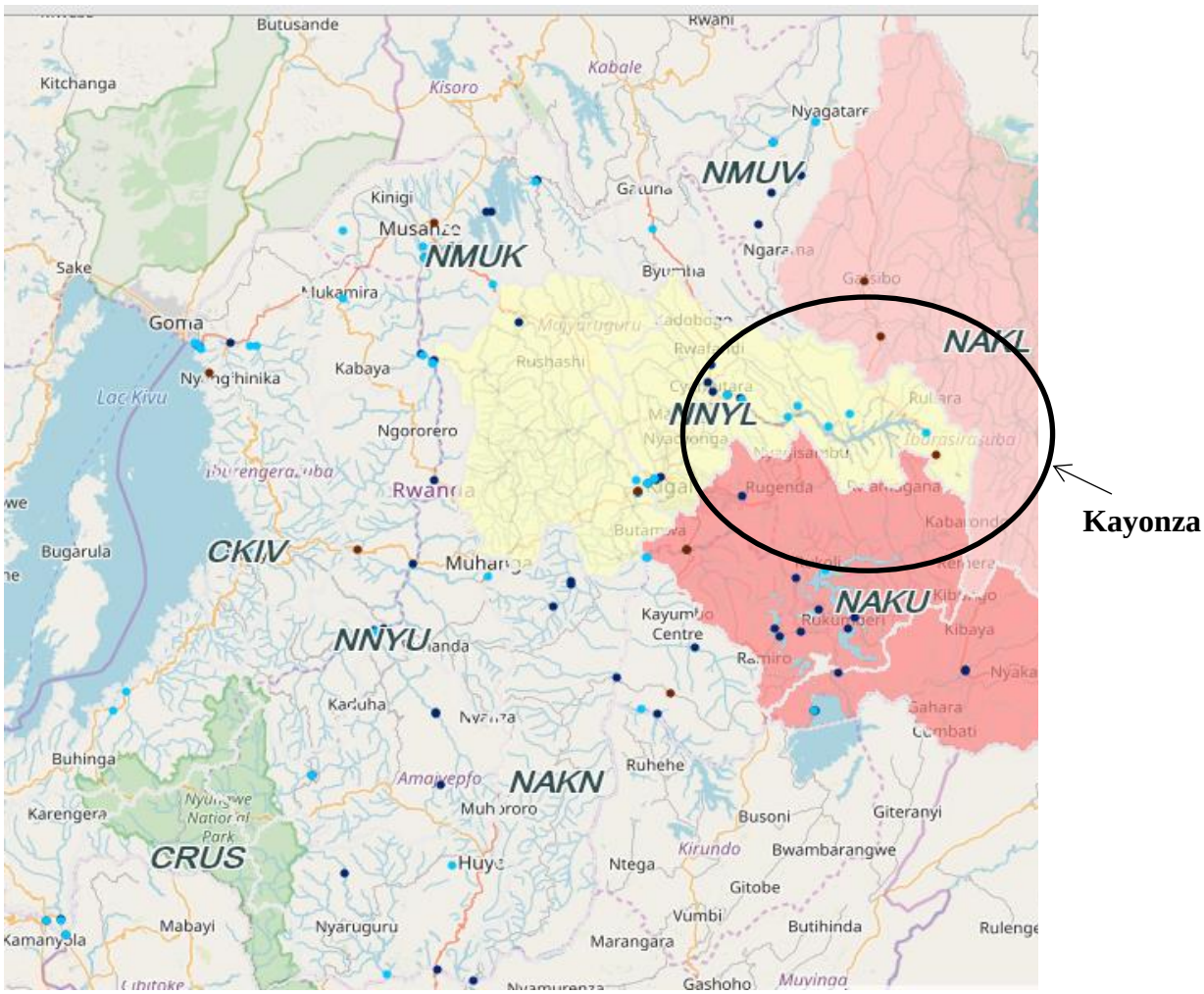
[42] MINAGRI and WFP, 2015

[43] Ministry of Natural Resources (MINIRENA/RNRA), 2015, Rwanda National Water Resources Master Plan, Appendix 7: Upper Akagera Catchment.

[44] REMA (2009): Rwanda State of Environment and Outlook Report".

catchments: a surface area of 3,269 km^2 in the lower Nyabarongo (NNYL in the figure 1 below), a surface area of 2,939 km^2 the upper Akagera catchment (NAKU in the figure 1 below), and a surface area of 3,223 km^2 the lower Akagera catchment (NAKL in the figure 1 below).

Figure 1: Localisation of Kayonza District in the lower Nyabarongo (NNYL), lower Akagera (NAKL) and the upper Akagera (NAKU) catchments in Rwanda (RNRA, 2015)[45]



14. The Nyabarongo catchment has good and deeply weathered soils with high infiltration rates in narrow valleys with steep gradients. However, there is significant erosion which is related to land use in particular agriculture and mining. In the Akagera catchments, the eastern lowlands have relatively fertile soils. The land covers of the catchments are dominated by rainfed agriculture and with significant areas of natural open land and forest plantations in the eastern parts. The western part of the Akagera floodplain is used for irrigated / agricultural wetland and the central and eastern parts are preserved as natural wetland (RNRA, 2015).

15. Considering the high water-demand for irrigation in the drought-prone sectors of Kayonza District, increasing irrigation schemes may compromise the availability and quality of water resources and sustainability of vital ecosystems. According to the Rwanda National Water Resources Master Plan, the current level of water use in lower Nyabarongo catchment is very low. The upper Akagera catchment (Naku in the figure 1) has a negative seasonal water balance and it is estimated that the

[45] https://esri-rw.maps.arcgis.com/apps/opsdashboard/index.html#/a0d68c954ec142cda3554681489b3bc2.

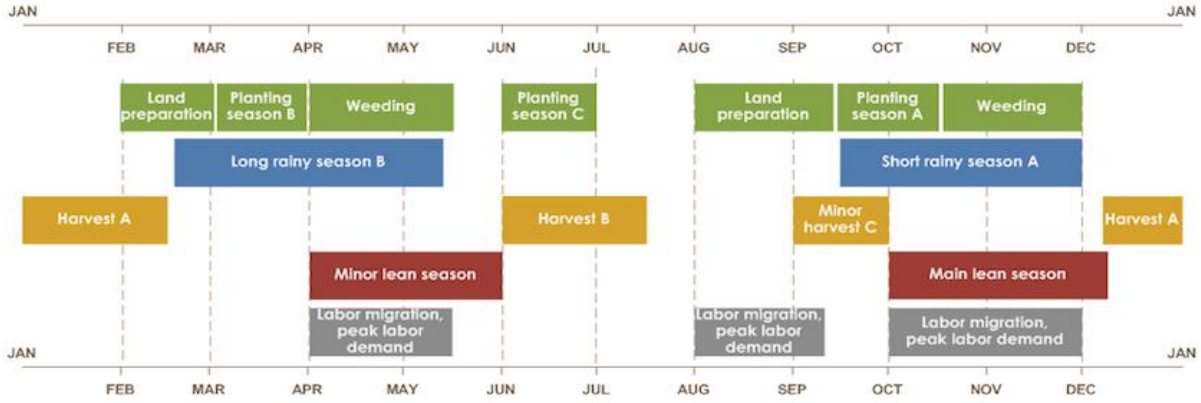
catchment will begin to suffer from limited water stress from 2020. The water balance for the lower Akagera catchment shows sufficient resources up till 2030, but will then undergo some limited stress during drier years from 2030 onwards (RNRA, 2015).

16. In addition, it is important to emphasize that the Kagera River also comprises significant territory in Burundi and Tanzania. These shared catchments require special consideration as part of the design of the KIIWP. Hence, the National Water Resources Master Plan recommends to closely monitor all irrigation developments, select the best suitable land and promote rational water use in respect of environmental flow, transboundary and international water resources management and downstream commitments.

Climate

17. Rwanda is ecologically diverse for its size ranging from highland mountain forests in the west to savannah grasslands and low altitude marshes in the east. The climate of Rwanda is dominated by the Inter Tropical Convergence Zone which passes over the country twice a year and is further modified by a widely varying altitude across the country (900 m in south-west, 1,500-2,000 m in the south and the centre of the country, 1,800-3,000 m in the highlands of the north and the west and 3,000-4,507 m in the regions of Congo-Nile Crest and the chain of volcanoes) and by the presence of large adjacent water bodies of the great lakes. Most of the country benefits from two agriculture rainy seasons (February - May; September – December) (see below figure 2 on typical seasonal calendar). The duration of the two rainy seasons is increasingly variable, ranging from seven to nine months, with an annual rainfall amount up to 1,500 mm. Rainfall in the eastern part of the country is below the national average of 1,250 mm per annum. For instance, Kayonza and Kirehe districts receive the lowest annual precipitation in the country, typically between 1,000 mmm to 1,200mm (MIDIMAR, 2015).

Figure 2: Rwandan seasonal calendar for a typical year[46]



18. Environmental and ecosystem degradation in Rwanda is triggered by two main factors: climate disturbances and anthropogenic activities. The former is caused by several factors including the El- Niño and La Niña phenomena associated with surface temperatures in the Indian and Atlantic Oceans. A study by the University of Reading[47] shows that climate variability in Eastern Africa is due to the influence of ocean –atmosphere climate phenomena, namely El Niño Oscillations (ENSO) and the Indian Ocean Dipole (IOD). Warm ENSO events are thought to be responsible for a build-up of warm sea surface temperatures (SSTs) in the Eastern Pacific Ocean which lead to increasing rainfall. These events are specifically observed in the short rains seasons. Furthermore, the recently discovered Indian Ocean Dipole

[46] Source: FEWSNET, May 2018.

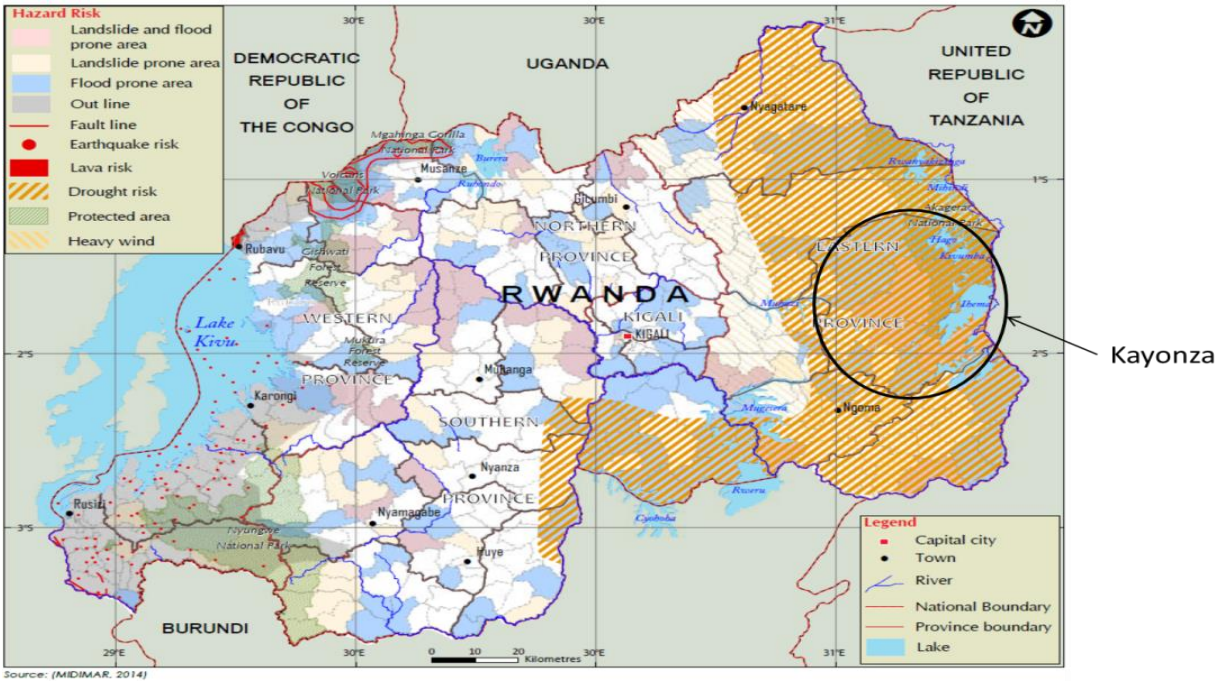
[47] Black, 2005, "The relationship between Indian Ocean sea surface temperature and East African rainfall", Phil. Trans. Roy. Soc., A.,N 363, 43-47.

(IOD), in addition to ENSO effects, most probably causes anomalously high rainfall in East Africa (see Marchal et al., 2006; REMA, 2011). For some years (1963, 1972, 1982, 1997), El Niño events are thought to have coincided with positive IOD events leading to high rainfall in East Africa, whereas high rainfall anomalies in East Africa have been documented when positive IOD events occurred independently of ENSO events. However, as East Africa has varied topography (e.g. mountains and rift valleys) its features are not yet adequately represented in climate model projections and deserve further investigation, especially with the modifying influence of the Congo basin.

19. Because of the growing population and associated pressure on agricultural lands, the grazing areas in Eastern Province are shrinking due to the encroachment for crop cultivation[48]. Therefore, the livestock sector suffers from lack of feeds due to shortage in pasture land, insufficient and/or non-controlled commercial feeds.

20. In 2015, the Ministry of Disaster Management and Refugees Affairs (MIDIMAR) published the National Risk Atlas. This report encompasses a comprehensive assessment of existing risks at national and local levels (see figure 3 below). It highlights that over the last decade, the frequency and severity of natural disasters, such as floods and droughts, have significantly increased. The extreme weather events have recently destroyed crops, caused serious environmental degradation and led to food insecurity, malnutrition and famine in affected areas, with water shortages affecting livestock and pasture productions.

Figure 3: Map of hazards risks in Rwanda (REMA, 2015)



Kayonza

21. The 2015 State of Environment and Outlook reports that the districts of Bugesera, Nyagatare, Gatsibo, Kayonza, Ngoma and Kirehe in the Eastern Province are the most prone to drought. These districts are affected by high frequency of rainfall deficit, late rainfall onsets, early rainfall cessations, and a significant number of dry spells (MIDIMAR, 2015). In addition, given the flat topography with little or no wind breaks, these districts are the most exposed to heavy windstorms.

[48] Eugene M, 2017, Characterization of cattle production systems in Nyagatare district of Eastern Province, Rwanda, Rheol: open access 1:107.

22. In 2016, the Eastern Province was affected by a severe drought which led to the death of 2,417 heads of cattle as well as poor crop yields during Season A[49]. As a result, more than 47,000 households in the districts of Kayonza, Nyagatare, Gatsibo Ngoma and Kirehe became food insecure. The Government of Rwanda had to provide household food relief and water for livestock to support the affected districts. Rwanda suffered from two consecutive years of droughts. In 2017, erratic and below-average rainfalls were recorded for the rainy season spreading from September to December (SOND).

Potential project's social, environmental, and climate change impacts and risks

Key potential impacts

23. Kayonza District has a total of agricultural land area of 114,290 ha, of which 56.4% is used for intensive croplands on the hillsides, 2.8% in the marshlands and 41% as rangelands (NISR, 2017). In addition, the main sources of water for irrigation are groundwater (85%), stream water (10%), lake water (2.5%).

24. In view of the current district agricultural land uses; there is a potential for increasing irrigated land areas as well as productivity. Hence, the project intends to build communities resilience through: (i) better management of water resources; (ii) promotion of climate-smart agriculture (CSA) and animal husbandry (AH) practices and technologies; (iii) efficient use of fertilizer through appropriate fertilizer selection, timing and split application; (iv) promotion of sound land husbandry and soil and water conservation practices (including use of nitrogen fixing trees such as agroforestry, erosion control measures, etc.); (v) enhancing access to improved seeds varieties; (vi) improving crop rotations; and (vii) reforestation of hillsides.

25. KIIWP's main expected positive impacts are:

- Enhanced food security and incomes and reduced rural poverty in project areas
- Enhanced access to water for human consumption
- Farmers' drought resilience strengthened
- Increased acreage of farmland under water-related infrastructure
- Increased acreage of farmland under climate resilient management and practices

26. KIIWP's potential negative impacts are:

- Increasing irrigation schemes may compromise the availability and quality of water resources and sustainability of vital ecosystems;
- Increasing irrigation schemes may increase environmental pollution due to release of agro-chemicals into soil, ground water, rivers
- Competition between water users in times of scarcity (especially irrigators and cattle owners);
- Growing competition for land between crop farmers and livestock keepers

Climate change and adaptation

27. The smallholder agricultural sector of Rwandan is dominated by rainfed production systems that are vulnerable to the vagaries of annual weather patterns and climate change Hence farming systems are affected by natural disasters loss of harvest or livestock, increased susceptibility to disease, and destruction of irrigation systems

[49] According to MINAGRI, 23,488 ha of crops were lost during Season A that stretches from October to December.

and other agricultural infrastructure. Climate variability will influence water availability during plant growth, water for livestock and increase incidence of diseases related to warm weather. In general, livestock is more resistant to climate change than crops because of its mobility and access to feed.

28. To ensure food security and conservation of the environment, the project will include improved farming methods such as climate-smart agriculture practices and technologies and selection of suitable crop and fodder species that are appropriate to the two agro-ecological zones that typifies Kayonza District, namely the Eastern Plateau and the Eastern Savanna. Project activities will consist of building local adaptive capacities to cope with prolonged dry spells and droughts, promotion of improved agricultural technologies from farm plot to market, crop diversification, soil conservation techniques, efficient use of fertilizers and improvements in soil quality through the promotion of integrated soil fertility management practices. These practices and technologies will be confirmed through participatory and interactive approach for the identification of needs and challenges. In addition, the project will contribute to carbon sequestration through adoption of agroforestry and afforestation initiatives (e.g. village nurseries); improved pasture management practices through the adoption of drought resistant forage and fodder varieties within the FFS, storage and proper use of manure; improving nutrient management so as to increase productivity and thus volume of crop residues available for soil carbon sequestration, soil fertility and animal feeds.

Environmental and social category (A)

29. The preliminary environmental and social category is **A** because KIIWP investments focus on irrigation and integrated watershed management and planning, including closely integrated activities and investments on water harvesting and storage, irrigation infrastructure development (area >100 ha) and marshland development. According to IFAD guidelines, all watershed management schemes (both hillsides and marshlands) with a command area exceeding 100 ha will be subjected to an Environmental and Social Impact Assessment (ESIA) before funds are released for the specific investments. The ESIAs will be aligned with the national General Guidelines for Environmental Impact Assessment (2006) and the Environmental and Social Management Guidelines for agriculture projects (2016). ESIA certificates are site-specific and valid for the entire project implementation phase. All feasibility studies for irrigation schemes, hydro-geological surveys for boreholes drilling and valley ponds, water permit requests and ESIA procedures will be financed and initiated during KIIWP 1 of project implementation, *which does not include any category A activities.*

30. The whole project will be coordinated through an Environmental and Social Management Framework (ESMF) to examine the risks and impacts of the proposed activities, including potential environmental and social vulnerabilities. In addition, the watershed management schemes with a command area below 100 ha will be further addressed through the ESMF. The ESMF will specify the environmental and social management requirements (including labour and working conditions, grievance redress system, health and safety) that will be the responsibility of contractors and primary suppliers hired to construct the irrigation infrastructure. Environmental and Climate change Plans will be developed for each site.

Climate risk category (High)

31. As a result of recent droughts events and the vulnerability of the Eastern Province to extreme events, the preliminary climate risk classification is **High**.

32. Climate change impacts in Rwanda vary depending on agro-ecological zones; while the North and Western provinces are more affected by flood events, Eastern and Southern provinces are more vulnerable to drought events. The impact of floods and droughts associated with El Nino and La Nina events of recent years are

thought to have been exacerbated by climate change and the environmental degradation observed throughout the country (NAPA, 2006; IPCC, 2014). Over the last decade, droughts tend to be cyclical and are becoming seasonal events of varying duration and intensity.

33. The mean annual temperature is expected to increase up to 3.25°C for the East Africa region by the end of the century resulting in proliferation of diseases (e*.g. Banana Xanthomonas, cassava brown streak disease, fungal and bacterial diseases in Irish potato*), crop decline (especially for maize and beans) and reduced land availability, which in return, affects food security and livestock production. Rainfall variability is more uncertain, though most of the models predict more extreme events with higher rainfall intensities leading to landslides, crop and livestock products losses, health risks and damages to infrastructure.

Recommended features of project design and implementation

Environment and social mitigation measures

34. The KIIWP project will adopt an integrated watershed management approach that will integrate appropriate crop and livestock production practices such as improved crop and fodder varieties; the promotion of a wide range of cost-effective erosion control measures (tree belts, contour belts, grass strips, contour bunds, planting of fodder grasses on bunds/ridges, use of permanent, perennial vegetation on contours, etc.); and agro-forestry (intercropping, integration of trees on farm plots, tree belts, protective forests, nitrogen fixing, erosion control measures, etc.).

35. Particular targeting mechanisms will be employed to ensure effective participation of women, women-headed households and youth through specific capacity building interventions targeted at these groups. In all capacity building activities, Gender Action Learning System (GALS) will be used to improve equal access of men and women to economic opportunities, decision-making processes and share of workload. Women will be specifically targeted to account for at least 50% of the project beneficiaries, and women-headed households and women in male-headed households will be empowered to build small businesses or effectively engage in the economic activities stimulated by the project. Youth will be particularly targeted as service providers through the young graduate programme initiated by MINAGRI to provide technical and managerial assistance to farmers' cooperatives, Irrigation Water Users Organisations and Water for Livestock User Organisations.

36. The project design includes the promotion of good nutrition practices that will raise awareness among communities of how to improve access to local foods and diversify family diets. Emphasis will be put on children, pregnant and breastfeeding mothers and people with HIV and AIDS who are the most vulnerable to malnutrition.

Climate change mitigation measures

37. **Mitigation measures** in agriculture can be categorized in three types of interventions[50]: (i) reducing the emissions intensity along the agriculture value chains, including avoided land use changes driven by agriculture and extensive use of agro-chemicals; (ii) sequestering additional carbon in agriculture systems; (iii) reducing overall agricultural production (e.g. by reducing food loss and waste) or shifting away from high-carbon intensity agricultural products.

38. The exact nature and extent of adaptation and mitigation measures to be adopted during design and implementation phases will be determined according to specific site locations and proposed size of irrigation scheme (*i.e. below or above a command area of 100 ha*), water harvesting and small storage technologies

[50] Dickie, A., Streck, C., Roe, S., Zurek, M., Haupt, F., Dolginow, A., 2014, "Strategies for Mitigating Climate change in Agriculture: Abridged Report." Climate Focus and California Environmental Associates, prepared with the support of the Climate and land uses Alliances.

(e.g. rainwater and floodwater harvesting, water storage units, etc.). The Ministerial order no 006/03 of 30/01/2017 drawing up a list of swamp lands, their characteristics and boundaries and determining modalities of their use, development and management shall be used to confirm project sites and the scope of KIIWP irrigation scheme development. In this way, the project will also contribute to the national efforts for enhancing environmental protection and conservation.

39. The project will support mitigation measures in terms of enhancement of agricultural productivity through climate-smart agriculture practices; restoration and management of pasture land; afforestation, reforestation and forest conservation through collaboration with the Ministry of Environment; and promotion of appropriate innovative and climate smart technologies and production systems (e.g. zero energy cooling chambers, metal silos or hermetic bags for storing grains/cereals, drying grounds and improved warehouses, etc.). In small irrigation schemes, solar energy could be used to pump water to avoid the use of expensive and GHG emitting fossil fuels.

40. **Climate information services** are proven to be effective options to cope with climate variability and climate change effects. KIIWP will thus encourage the communication and dissemination of meteorological bulletins tailored to climate risks and vulnerabilities specific to selected cash and food crops suitable to Kayonza District. The SPIU agro-meteorologist will continue the work initiated within PASP and collect data on quantity of rainfall; length of rainy season as well as dry season; sunrise and sunset times so as to better organize planting, harvest and drying stages of each value chain. The bulletins will be distributed to all relevant project stakeholders at sector, district, cooperative and community levels.

Incentives for good practices

41. **Water use efficiency and management**. Water development is hence a challenge for livestock production. Inadequate access to clean water affects livestock productivity, especially during the dry season. Given it dependency on water, the agricultural sector needs to manage its water demand by using more resource efficient techniques such as water storage tanks/ponds at household level, drip irrigation and treadle pumps and cultivating more drought-tolerant and less water demanding crop varieties.

Institutional analysis

Institutional framework

42. The **National Strategy on Climate Change and Low-Carbon Development (NCCLCD)** for Green Growth and Climate Resilience underlines the need to manage the implications of climate variability for the social, environmental and economic development of the country. Given that Rwanda seasonal agriculture is vulnerable to climate change and population pressure, the strategy recognizes that slight changes in rainfall patterns would have significant impacts on crop and livestock production. Therefore, the Green Growth Plan fosters the development of irrigation infrastructure that give farmers more control of the water resource, facilitate diversification of crops, contribute to efficient land and water usage and ensure water availability in dry areas.

43. The **Intended Nationally Determined Contributions** are built upon the NCCLCD and advocate for a climate resilient economy. The framework aims at achieving Category 2 energy security and low carbon energy supply that supports the development of green industry and services, sustainable land-use and water resource management, appropriate urban development as well as biodiversity and ecosystem services. The development of irrigation infrastructure and other water efficient technologies will contribute to both sustainable intensification of agriculture and integrated water resources management and planning, which are

the pillar for enhancing food security and biodiversity and ecosystem conservation and preservation.

44. The **National Forest Policy** intends to make the forestry sector one of the bedrocks of economy and national ecological balance for sustainable benefits to all segments of the society. The policy purposes at (i) contributing to sustainable land use through soil, water and biodiversity conservation, and tree planting through the sustainable management of forests and trees; (ii) strengthening the participation of communities and other stakeholders in forest management to conserve water catchment areas, forest biodiversity and ensure sustainability of the forest sector; (iii) promoting farm forestry to produce timber, wood fuel and to supply wood and non-wood forest products; (iv) promoting forest extension to enable farmers and other forest stakeholders to benefit from forest management approaches and technologies. These objectives will be reflected in the project activities.

45. Given its mandate that focuses solely on agricultural development, the Ministry of Agriculture and Animal Resources (MINAGRI) recommended to liaise with the Ministry of Environment and discuss further on the potential collaboration with regard to the planned reforestation/afforestation activities. Indeed, for the Ministry of Environment has launched a special planting programme in the Eastern province. The region was selected because it is the least afforested in the country and presents high rate of population growth, deforestation and associated land degradation. The programme aims at (i) increasing forest cover in the eastern province, (ii) increasing wood production to meet farmers demand, (iii) sustainable forest and land management and increasing trees on farm for improved soil productivity environment protection.

46. The programme will be implemented by the district authorities with the support of Rwanda Water and Forest Authority (RWAFA) and local communities. It is envisaged that the special planting programme will include KIIWP project areas and the implementation arrangements will be further confirmed during the project design phase.

47. In 2015, the Ministry of Disaster management and refugees affairs elaborated the **National Contingency Plan for Drought** that aims at minimizing drought impacts by improving agency coordination; enhancing monitoring and early warning capabilities, water shortage impact assessments and preparations, response, and recovery programs. The crucial objective of the drought response system is to promote early mitigation efforts that reduce the time that elapses between the drought early warning message and the active response at the country level.

48. The phase 4 of the **Strategic Plan for Agricultural Transformation (PSTA 4)** outlines the priority public investments in agriculture and estimates required public resources for the agricultural sector for the period 2018/2024. As changes in weather and climate patterns are becoming more acute, PSTA 4 seeks to build resilience through on-farm measures and enabling actions to increase productivity. Maintaining and promoting farmers' practice of mixing crop varieties mitigates certain risks, including the spread of pest and diseases as well as ensuring dietary diversity. PSTA 4 emphasises alternative land management to complement terracing with comprehensive climate smart soil and integrated watershed management. PSTA 4 also encourages better weather and climate information and early warning and seeks to ensure all investments are climate smart.

Capacity building

49. The KIIWP project will focus on building the capacity of the local population in the following realms:

i. **Land husbandry and water conservation practices** which consist of a holistic and comprehensive approach tailored to local conditions in order to protect natural base resources and enhance the productive capacity of land and soil. The benefits are higher yields and improved vegetative cover, reduced raindrop impact and runoff, improved soil composition and fertility, and enhanced farm livelihoods.

ii. **Animal husbandry and climate smart livestock practices** will encourage the potential of the livestock sector to mitigate its environmental impacts while increasing energy efficiency and enhancing rural livelihoods. This approach aims at conserving natural resources, raising productivity, increasing animal productivity and optimizing the use of resources.

iii. **Climate information service** package will include multi-disciplinary workshops on seasonal forecasts in order to assist small scale farmers in understanding weather information, climate risk management along their respective value chains and related agro-advisory services. Consequently, the workshop participants will receive daily weather information considered as generally valuable in helping plan farming operations, particularly when to plant, when to harvest and good drying days.

Additional funding

50. Given the project focus on building resilience in the drought prone sectors of Kayonza District, MINAGRI has suggested to leverage additional climate financing to further support adaptation and mitigation measures, especially in terms of green growth of the agricultural sector, expansion of multi-purposes water infrastructures, the promotion of low carbon and energy saving solutions and climate-smart technologies (solar panels, climate resilience building, mechanized equipment, etc.).

Monitoring and Evaluation

51. A participatory M&E system will be developed and poverty and gender studies will monitor effectiveness and relevance of KIIWP targeting mechanism. Logframe and results framework include indicators that reflect the target groups. Data will be sex- and age-disaggregated where appropriate.

52. The monitoring and evaluation of environmental indicators will be further refined on the basis of the finding of the ESMF to be conducted during project design phase. The ESMF shall include feasible and cost-effective measures to maximise opportunities and prevent or reduce significant negative impacts in accordance with the mitigation hierarchy. The study will estimate the impacts and costs of those measures, and the institutional and training requirements to implement them. The below table provides preliminary guidance on key parameters to assess and monitor during project inception and implementation phases.

Table 2: Preliminary Environmental Management Plan

Parameter	***Activity***	***Performance indicator***	***Baseline data***	***Responsibility during project implementation***	***Monitoring means*** **d) = design** **(o) = operation**	***Recommended frequency of monitoring***
Agro-chemicals released into soil, ground water, rivers and lakes	Monitor water quality at given sample sites along drainage network, at collection pond, and point of discharge to river	pH, salinity, EC, suspended solids, nitrates, phosphates, POPs, heavy metals concentrations in river water	Baseline sampling Hydro-geological survey done during ESMF	Project Implementation Unit	(d) baseline Sampling (d) hydro-geological survey at project inception (o) test results	d) once to set benchmark (o) 2 samples per year (dry/rainy season)
Herd mismanagement causes damages to vegetation cover and soil structure	Integrated crop/livestock systems; management and recycling of livestock manure as organic nutrients for restoring soil fertility; and (vii) range restoration and enhancement.	artificial barriers; livestock ownership patterns, land/population ratios; animal performances, feeding systems, forage production, quality of carcasses	baseline sampling	Project Implementation Unit	(d) baseline sampling (o)	(d) once to set benchmark (o) MTR and completion
Soil erosion	Monitor erosion	soil erosion control measures such as reforestation, reseeding of grasses, land preparation, terracing, etc.	Baseline sampling	Project Implementation Unit	(o) baseline sampling (o) hydro-geological survey at project inception (o) site visits by project staff	(o) for vulnerable sites, monthly in dry season, weekly during rainy season
	Monitor efficiency of erosion control measures	Monitor quality of soil for nutrient depletion and loss in structure	baseline sampling	Project Implementation Unit	(o) baseline sampling (o) hydro-geological survey at project inception and completion (o) site visits by project staff	(o) for vulnerable sites, monthly in dry season, weekly during rainy season

Further information required to complete screening, if any

53. As part of the KIIWP design process, IFAD and MINAGRI will hire an independent consultant to develop an Environmental and Social Management Framework (ESMF) to examine the risks and impacts of water abstraction from the lakes, rivers and streams, development of livestock valley dams and irrigation schemes (with a command area below or above 100 ha). The study will analyse any potential environmental and social vulnerabilities of the identified project area. The ESMF report will provide mitigation measures to reduce and/or offset adverse risks and impacts, and estimate the costs of such measures. In addition, in consideration of future potential water imbalance in the Akagera catchment area, it is recommended to carry out hydrogeological survey of the hydrological network in Kayonza District.

Stakeholder consultations

54. A stakeholder meeting was organised during the first design mission. The audience was composed of representatives of the civil society, farmer's organisations, local authorities, private sector and Rwanda Agricultural Board. Through group discussions, the participants reviewed project objectives, approach and activities. The participants emphasize the need to enhance soil erosion control measures, to increase water access at household level, promote reforestation initiatives, feeder road construction and rehabilitation.

Annex 6: First Annual Work Plan and Budget (AWPB)

Kayonza Irrigation and Integrated Watershed Management Project (KIIMP)

18 Month (6-Quarters) Work Plan and Budget

Component 1: Strengthening resilience to droughts with CSA

Sub-Component 1.1:Catchment Protection

Activity No.	Activity per component & sub-component	Implementing Agency	IFAD Cat	Unit	18 Months Plan Period: Oct 2019-March 2021						Total	Unit Price USD	Total USD
					Q1	Q2	Q3	Q4	Q5	Q6			
1	Staff recruitment	SPIU											
	Procure Service provider to take the lead in implementation of the land husbandry activities.	SPIU	S	no							1	500 000	500 000
	Procure /provide lime & organic manure	SPIU	G	no							1	50 000	50 000
2	Procure service provider, for farm level rainwater harvesting technologies.	SPIU	S	no							1	3 000	3 000
3	Implementation of Land husbandry activities	SPIU		Ha							420	3 000	1 260 000
4	construction of farm level rainwater harvesting structures	SPIU	W	No							90	5 000	450 000
5													
6	**Sub-total for 1..1.1 Phase1**												**2 263 000**

Activity No.	Activity per component & sub-component	Impl. Agency	IFAD Cat	Unit	18 Months Plan Period: Oct 2019-March 2021						Tot	Unit Price USD	Total USD
					Q1	Q2	Q3	Q4	Q5	Q6			
1	Staff recruitment	**SPIU**											
	Recruitment of service provider for sub catchment mapping		**S**	**no**									60000
	Formation and capacity building of District & Scheme Steering committee										**4**	**15 000**	60000
2	Formation&strengthening of subcatchment committees (10)*	**SPIU**		**no**							**10**	**3 000**	**30000**
3	Mapping waterseds, production of sub-catchement management plans	**SPIU**		**no**							**10**	**6 000**	**60000**
4	Formation&strengthening of livestock water users organisations (35)	**SPIU**		**no**							**35**	**3 000**	**105000**
5													
6	**Sub-total for 1.3 KIIWP1**												**255 000**
7													
8													

Kayonza Irrigation and Integrated Watershed Management Project (KIIMP)

18 Month (6-Quarters) Work Plan and Budget

Component 1: Strengthening resilience to droughts with CSA

Activity No.	Activity per component & sub-component	Implementing Agency	IFAD Cat	Unit	18 Months Plan Period: Oct 2019-March 2021						Total	Unit Price USD	Total USD
					Q1	Q2	Q3	Q4	Q5	Q6			
1	Recruitment of Staff (Irrigation Specialist ,Irrigation Engineer, Irrigation Technician,)	SPIU											
2	Prepare terms of reference and contract SP for hydro-geological studies and supervision of drilling and eqquiping boreholes												
3	Prepare terms of reference and contract SP for design and supervision of constraction of valley tanks												
4	Preparing of Tender documents & tender for drilling and eqquiping 20 Bore Holes	SPIU											
5	Preparing of Tender documents & tend for Valley 15 tanks Works												
6	Drilling and eqquiping of 20 Bore holes	SPIU	W	no							10	20 000	200 000
7	Supervision of 20 Bore holes works	SPIU	S	no							1	10 000	10 000
8	Implementation of 10Valley Tanks	SPIU	W	no							10	200 000	2 000 000
9	Supervsion of 1Valley Tanks works	SPIU	S	no							1	50 000	50 000
	Total Expenditure for the plan period												2 260 000

Kayonza Irrigation and Integrated Watershed Management Project (KIIMP)

18 Month (6-Quarters) Work Plan and Budget

Component 1: Strengthening resilience to droughts with CSA

1.2 Irrigation Development

1.2.1: Feasiblity Studies&ESIAs

Activity No	Activity per component & sub-component	Sub-Activity	Implementing Agency	IFAD Cat	Unit	18 Months Plan Period: Oct 2019-March 2021						Total	Unit Price USD	Total USD
						Q1	Q2	Q3	Q4	Q5	Q6			
1	Staff Recruitment		SPIU											
2	Prepare TORs for Feasibility Studies & ESIAs													
3	Procure Service Providers for the feasibility Studies and ESIAs													
4	Undertake feasibility study of Kabare Irrigation Scheme (600ha)		SPIU	S								800	600	480 000
5	Undertake Feasibility Study & Design Kanyeganyege Irrigation Scheme (150ha)		SPIU	S								800	150	120 000
6	Undertake Feasibility Study & DesignGishyanda Irrigation Scheme (125ha		SPIU	S								800	125	100 000
7	Feasibility studies & Design: Pipeline projects for 5,000ha		SPIU	S								800	5 000	4 000 000
8	Full ESIA for Kabare Irrigation Scheme		SPIU	S								150 000	1	150 000
9	Full ESIA for Kanyeganyege Irrigation Scheme		SPIU	S								150 000	1	150 000
	Full ESIA for Gishyanda Irrigation Scheme		SPIU	S								150 000	1	150 000
	Full ESIAs: Pipeline projects		SPIU	S								1 500 000	1	1 500 000
	sub-total 1.2.1 Phase 1													**6 650 000**

Kayonza Irrigation and Integrated Watershed Management Project (KIIMP)

18 Month (6-Quarters) Work Plan and Budget

Component 1: Strengthening resilience to droughts with CSA

Sub-Component 1.3: Infrastructure Management Institutions

Activity No.	Activity per component & sub-component	Implementing Agency	IFAD Cat	Unit	18 Months Plan Period: Oct 2019-March 2021						Total	Unit Price USD	Total USD
					Q1	Q2	Q3	Q4	Q5	Q6			
1	Staff recruitment	SPIU											
	Recruitment of service provider for sub catchment mapping		S	no									60000
	Formation and capacity building of District & Scheme Steering committee										4	15 000	60000
2	Formation&strengthening of subcatchment committees (10)*	SPIU		no							10	3 000	30000
3	Mapping waterseds, production of sub-catchement management plans	SPIU		no							10	6 000	60000
4	Formation&strengthening of livestock water users organisations (35)	SPIU		no							35	3 000	105000
5													
6	**Sub-total for 1.3 Phase1**												**255 000**

Annex 7: Procurement Plan for first 18 months

KIIWP 18-MONTH (OCTOBER 2019-MARCH 2021) PROCUREMENT PLAN

	Description	Component Ref	Planned & Actual dates	Total Cost in US$	Procurement Method	Receive approved Specs	Write RFB/RFQ	Approval	Launch/ Invite Bidders	Receive Bids	Evaluate Bids	Approval	Sign Contract
1	construction of farm level rainwater harvesting structures		Planned	450 000	National Competitice Bidding	15/01/2020	20/01/2020	20/01/2020	30/01/2020	28/02/2020	03/07/2020	03/10/2020	17/03/2020
			Actual										
2	Drilling and eqquiping of 20 Bore holes		Planned	200 000	National Competitice Bidding	20/01/2020	25/01/2020	25/01/2020	02/10/2020	03/11/2020	18/3/2020	21/3/2020	25/03/2020
			Actual										
3	Implementation of 10Valley Tanks		Planned	2 000 000	International competitive bidding	15/01/2020	20/01/2020	20/01/2020	30/01/2020	28/02/2020	03/07/2020	03/10/2020	17/03/2020
			Actual										
	TOTAL WORKS			**2 650 000**									

KIIMP ANNUAL PROCUREMENT PLAN

	Description	Component Ref	Planned & Actual dates	Total Cost in US$	Procurement Method	Receive approved Specs	Bidding Document Preparation	Approval	Bid Invitation date/Publication	Receive Bids/Bids Opening	Evaluate Bids	Approval	Sign Contract
1	Procure /provide lime & organic manure		Planned	**50 000**	National Competitice Bidding	25/10/2019	11/04/2019	11/04/2019	11/06/2019	12/06/2019	12/10/2019	15/12/2019	15/01/2020
			Actual										
	TOTAL GOODS			**50 000**									

KIIWP 18 MONTH (OCT 2019-MARCH 2021) PROCUREMENT PLAN

	Description	Component Ref	Plan vs Actual	Total Cost in US$	Procurement Method	Receive approved TOR	REOI Issue	Receive EOIs	Evaluate EOIs	Approval	RFP Prep	Approval	RFP Issue	Receive Proposals	Eval start	Eval End	Submit TechEval Report	Approval	Open FinPros	Evaluate FinPros	Submit Combined Report	Approval	Negotiations	Contract Signature
1	Procure Service provider to take the lead in implementation of the land husbandry activities.		Planned	500 000	National Competitive Bidding/**QCBS**	02/10/2020	03/08/2020	04/09/2020	16/04/2020	19/4/2020	30/04/2020	30/04/2020	05/02/2020	30/5/2020	06/02/2020	06/11/2020	06/11/2020	06/11/2020	25/6/2020	28/6/2020	28/6/2020	29/6/2020	15/7/2020	29/7/2020
			Actual date																					
2	Procure service provider, for farm level rainwater harvesting technologies.		Planned	3 000	National Competitive Bidding/**QCBS**	02/10/2020	03/08/2020	04/09/2020	16/04/2020	19/4/2020	30/04/2020	30/04/2020	05/02/2020	30/5/2020	06/12/2020	21/6/2020	21/6/2020	21/6/2020	07/05/2020	07/08/2020	07/08/2020	07/09/2020	25/7/2020	08/08/2020
			Actual date			02/10/2020	03/08/2020	04/09/2020	16/04/2020	19/4/2020	30/04/2020	30/04/2020	05/02/2020	30/5/2020	06/02/2020	06/11/2020	06/11/2020	06/11/2020	25/6/2020	28/6/2020	28/6/2020	29/6/2020	15/7/2020	29/7/2020
3	Undertake Feasibility Study & Design Kanyeganyege Irrigation Scheme (150ha)		Planned	120 000	National Competitive Bidding/**QCBS**	20/6/2019	07/08/2019	08/09/2019	16/8/2019	19/8/2019	30/8/2019	30/8/2019	09/02/2019	30/9/2019	10/02/2019	10/11/2019	10/11/2019	10/11/2019	25/10/2019	28/10/2019	28/10/2019	29/10/2019	13/11/2019	22/11/2019
			Actual date			02/10/2020	03/08/2020	04/09/2020	16/04/2020	19/4/2020	30/04/2020	30/04/2020	05/02/2020	30/5/2020	06/02/2020	06/11/2020	06/11/2020	06/11/2020	25/6/2020	28/6/2020	28/6/2020	29/6/2020	15/7/2020	29/7/2020
4	Undertake Feasibility Study & DesignGishyanda Irrigation Scheme (125ha		Planned	100 000	National Competitive Bidding/**QCBS**	01/07/2020	20/01/2020	21/02/2020	28/02/2020	28/02/2020	03/10/2020	03/10/2020	03/10/2020	04/10/2020	13/04/2020	17/04/2020	17/04/2020	20/04/2020	05/01/2020	05/08/2020	05/08/2020	05/08/2020	18/05/2020	22/05/2020
			Actual date																					
5	Supervision of 20 Bore holes works		Planned	10 000	National Competitive Bidding/**QCBS**	01/07/2020	20/01/2020	21/02/2020	28/02/2020	28/02/2020	03/10/2020	03/10/2020	03/10/2020	04/10/2020	13/04/2020	17/04/2020	17/04/2020	20/04/2020	05/01/2020	05/08/2020	05/08/2020	05/08/2020	18/05/2020	22/05/2020
			Actual date																					
6	Supervsion of I Valley Tanks works		Planned	50 000	National Competitive Bidding/**QCBS**	17/1/2020	30/01/2020	30/02/2020	03/08/2020	03/08/2020	20/3/2020	20/3/2020	20/3/2020	20/4/2020	23/04/2020	27/04/2020	30/04/2020	30/04/2020	05/11/2020	18/5/2020	18/5/2020	18/5/2020	28/05/2020	06/02/2020
			Actual date																					
7	Undertake feasibility study of Kabare Irrigation Scheme (600ha)		Planned	480 000	International Competitive Bidding/QCBS	20/1/2020	03/05/2020	30/02/2020	20/3/2020	23/3/2020	04/03/2020	04/03/2020	04/06/2020	04/08/2020	04/12/2020	22/04/2020	22/04/2020	29/04/2020	20/5/2020	27/5/2020	27/5/2020	06/01/2020	06/08/2020	28/6/2020
			Actual date			20/1/2020	03/05/2020	30/02/2020	20/3/2020	23/3/2020	04/03/2020	04/03/2020	04/06/2020	04/08/2020	04/12/2020	22/04/2020	22/04/2020	29/04/2020	20/5/2020	27/5/2020	27/5/2020	06/01/2020	06/08/2020	28/6/2020
8	Full ESIA for Kabare Irrigation Scheme		Planned	150 000	National Competitive Bidding/**QCBS**	20/1/2020	02/05/2020	30/02/2020	20/3/2020	23/3/2020	04/03/2020	04/03/2020	04/06/2020	04/08/2020	04/12/2020	22/04/2020	22/04/2020	29/04/2020	20/5/2020	27/5/2020	27/5/2020	06/01/2020	06/08/2020	28/6/2020
			Actual date																					
9	Feasibility Studies and Detailed design for pipeline project 5,000ha		Planned	4 000 000	International Competitive Bidding/QCBS	20/1/2020	03/05/2020	30/02/2020	20/3/2020	23/3/2020	04/03/2020	04/03/2020	04/06/2020	04/08/2020	04/12/2020	22/04/2020	22/04/2020	29/04/2020	20/5/2020	27/5/2020	27/5/2020	06/01/2020	06/08/2020	28/6/2020
			Actual date																					
10	Environemental Social Impact Assessment (ESIA) for pipeline projects 5,000ha		Planned	1 500 000	International Competitive Bidding/QCBS	20/1/2020	03/05/2020	30/02/2020	20/3/2020	23/3/2020	04/03/2020	04/03/2020	04/06/2020	04/08/2020	04/12/2020	22/04/2020	22/04/2020	29/04/2020	20/5/2020	27/5/2020	27/5/2020	06/01/2020	06/08/2020	28/6/2020
			Actual date																					
	Full ESIA for Kanyeganyege Irrigation Scheme		Planned	150 000	National Competitive Bidding/**QCBS**	20/1/2020	02/05/2020	30/02/2020	20/3/2020	23/3/2020	04/03/2020	04/03/2020	04/06/2020	04/08/2020	04/12/2020	22/04/2020	22/04/2020	29/04/2020	20/5/2020	27/5/2020	27/5/2020	06/01/2020	06/08/2020	28/6/2020
			Actual date																					
	Full ESIA for Gishyanda Irrigation Scheme		Planned	150 000	National Competitive Bidding/**QCBS**	01/07/2020	20/01/2020	21/02/2020	28/02/2020	28/02/2020	03/10/2020	03/10/2020	03/10/2020	04/10/2020	13/04/2020	17/04/2020	17/04/2020	20/04/2020	05/01/2020	05/08/2020	05/08/2020	05/08/2020	18/05/2020	22/05/2020
			Actual date																					
	Full ESIAs: Pipeline projects		Planned	1 500 000	International Competitive Bidding/QCBS	20/1/2020	03/05/2020	30/02/2020	20/3/2020	23/3/2020	04/03/2020	04/03/2020	04/06/2020	04/08/2020	04/12/2020	22/04/2020	22/04/2020	29/04/2020	20/5/2020	27/5/2020	27/5/2020	06/01/2020	06/08/2020	28/6/2020
			Actual date																					
	Recruitment of service provider for sub catchment mapping		Planned	50 000	National Competitive Bidding/**QCBS**	01/07/2020	20/01/2020	21/02/2020	28/02/2020	28/02/2020	03/10/2020	03/10/2020	03/10/2020	04/10/2020	13/04/2020	17/04/2020	17/04/2020	20/04/2020	05/01/2020	05/08/2020	05/08/2020	05/08/2020	18/05/2020	22/05/2020
			Actual date																					
	TOTAL SERVICES			**8 763 000**																				

Legend:

N.A.: Not Applicable

QCBS: Quality Cost Based

Procurement Plan

Project: **Kayonza Irrigation and Integrated Watershed Management Project (KIIMP)**

Version:

Column1	Planned	Actual
Goods	50 000	
Works	2 650 000	
Services	8 763 000	
Totals	**11 463 000**	

Annex 8: Draft Project Implementation Manual (PIM)

Please see attached.

Annex 9: Integrated Risk Framework (IRF)

Risk categories	Risk Probability (H, M or L)	Risk Impact (H, M, L)	Mitigations/ comments
1. Political and governance	L	L	Over the last 20 years, Rwanda has enjoyed political stability which, combined with good governance and policy consistency, has created an enabling policy environment ensuring successful delivery of development programs.
2. Macroeconomic	M	L	Since 2000, Rwanda has seen its economy grow by 7.9% per year. It is currently more than 3.5 times larger than in 2000. In the same period, GDP per capita has increased from USD 242 to USD 729. According to IMF's analysis, the medium-term macroeconomic outlook remains favourable and the GDP growth is expected to remain strong. This is supported by continued diversification of the export base, public investment spending to crowd-in private sector investment, and more resilient agriculture as a result of extensive irrigation programs. Inflation is expected to remain within the central bank's target of 5%.
3. Sector strategies and policies	L	L	The project will likely benefit from a highly enabling policy and institutional environment, with a series of new laws and policies coming into force that are fully supportive of the development of water infrastructure and cooperative development. Indeed, the sustainable development of irrigated agriculture as a key driver to boost agriculture production and productivity is fully acknowledged in most of Rwanda's flagship policy documents. Identified gaps in terms of operationalisation of new policies, laws, regulations and institutional framework will be addressed with KIIWP support. To this end, KIIWP 1 will conduct an evaluation of implementation and impact of new or existing policies related to the project activities with relevant national, and district level stakeholders.
4. Technical design of project or program	M	L	There is a low likelihood that factors related to the technical design of the program or project may adversely impact the achievement of the project objective. The project will be implemented in two phases to initially undertake the necessary preparatory activities for irrigation development and address the urgent need for catchment rehabilitation and protection in rainfed farming areas and improved water supply for livestock. The detailed design of KIIWP 2 investments in irrigation development, climate smart agricultural production and market access will be informed by extensive analytical work beforehand. Plus, IFAD and the Government have good experience implementing similar projects well (e.g. KWAMP).
5. Institutional capacity for implementation and sustainability	L	L	Rwanda has an overall solid track record in project implementation and management, characterized by a recognized result-based approach and high level of financial management and procurement compliance, However, limited technical capacity, governance and institutional capacities of project stakeholders can lead to slow disbursement, lower project benefits as well as delays in implementation. Raising awareness and capacity building are key elements in KIIWP, especially of FOs and District, Sector and Cell level staff. As demonstrated by the Kirehe Community-based Watershed Management Project (KWAMP), a district-level approach in project design and implementation contributes to strong district ownership and capacity-building in planning, implementing and monitoring agricultural transformation. The institutional arrangements for KIIWP

			will be fully aligned with the current implementation framework of IFAD-funded projects in Rwanda. In particular, the Single Project Implementation Unit (SPIU) is already in place with core staff. The (SPIU) is effective in guiding the process of designing and implementing projects together with IFAD (and the World Bank). Involvement of experienced technical staff from KWAMP will also speed up project implementation
6. Financial management	L	M	The last PEFA assessment of Rwanda was in 2016. Compared to the previous one carried out in 2010, seven of eleven indicators improved while four indicators remained the same. With regard to government accountability, transparency and corruption factors, the most recent Transparency Internaitonal perception index shows that Rwanda scored 55 on the 1 – 100 scale with a global rank of 48 out of 180 Countries assessed and being the third least corrupt Country assessed in Sub-Saharan Africa. The IFAD overall fiduciary risk based on the ongoing projects and the recently closed KWAMP has been assessed as low. The implementation arrangements that pose a risk of low disbursements may arise from delays in start-up due to delays in re-defining the SPIU, delays in carrying out the Environmental and Social Impact Assessments (ESIAs) that are a condition for approval of major irrigation infrastructure and delays in reconfiguring the project chart of accounts that may cause delays in submission of withdrawal applications; delays in financial reporting, among others. Overall assessment indicates that Rwanda is a medium risk country, characterized by strong financial management systems and internal controls. Design arrangements have taken into account this medium inherent risk, and proposed implementation and financial management based on GoR systems and minimising IFAD financial management requirements.
7. Procurement	L	L	Procurement will be carried out in accordance with government regulations and should comply with IFAD requirements to be specified in the Letter to the Borrower and the Financing Agreement. The IFAD SPIU already in place under RAB will be responsible for procurement at the national level. A Procurement specialist is budgeted for and will be recruited to ensure procurements are well executed and monitored. Procurement at the district-level will be delegated to the District's Corporate Division. IFAD considers the procurement capacity of the district to be satisfactory, and this arrangement builds on the successful experience of KWAMP.
8. Stakeholders	L	L	The likelihood and/or impact of stakeholder opposition to the project is low. Project objectives, approach and activities were discussed during the first design mission at a stakeholder meeting composed of representatives from civil society, farmer's organisations, local authorities, the private sector and the Rwanda Agricultural Board. The whole project will be coordinated through an Environmental and Social Management Framework (ESMF) to examine the risks and impacts of the proposed activities, including potential environmental and social vulnerabilities. The ESMF specifies the environmental and social management requirements (including labour and working conditions, grievance redress system, health and safety) that will be the responsibility of contractors and primary suppliers hired to construct the irrigation infrastructure. To mitigate competition between water users (especially irrigators and cattle owners) in times of scarcity, KIIWP 1 will support the increase in water storage and water supply. It will also strengthen the institutional development of various natural resource and infrastructure management committees to support joint management of limited resources within catchment areas.
9. Environment	H	M	As a result of the Eastern Province's vulnerability to cyclical and persistent drought events, there is a

and social			high probability that climate change will challenge the achievement of project objectives. Land fragmentation and high population density continue to lead to catchment degradation. However KIIWP is designed in direct response to these risks so the potential impact of these risks on project objectives is moderate. KIIWP will adopt an integrated watershed management approach that will integrate appropriate crop and livestock production practices such as improved crop and fodder varieties; the promotion of a wide range of cost-effective erosion control measures (tree belts, contour belts, grass strips, contour bunds, planting of fodder grasses on bunds/ridges, use of permanent, perennial vegetation on contours, etc.); and agro-forestry (intercropping, integration of trees on farm plots, tree belts, protective forests, nitrogen fixing, erosion control measures, etc.). Climate information services or bulletins will be distributed to all relevant project stakeholders at sector, district, cooperative and community to help them cope with climate variability and climate change effects. Resilience will also be strengthened through the promotion of climate smart agriculture. To mitigate any adverse environmental and social impacts of the project, all watershed management schemes with a command area exceeding 100 ha will be subjected to an Environmental and Social Impact Assessment (ESIA) before funds are released for the specific investments. The ESIAs will be aligned with the national General Guidelines for Environmental Impact Assessment (2006) and the Environmental and Social Management Guidelines for agriculture projects (2016). ESIA certificates are site-specific and valid for the entire project implementation phase. All feasibility studies for irrigation schemes, hydro-geological surveys for boreholes drilling and valley ponds, water permit requests and ESIA procedures will be financed and initiated during KIIWP 1. The exact nature and extent of adaptation and mitigation measures to be adopted during design and implementation phases will be determined according to specific site locations and proposed size of irrigation, water harvesting and small storage technologies. Furthermore, the whole project will be coordinated through an Environmental and Social Management Framework (ESMF) to examine the risks and impacts of the proposed activities.
Overall	M	L	

The three available ratings are high (H), medium (M) and low (L).
Risk Impact (also called severity) can be both expressed in rating scales or in narrative in the comments column. Risk impact should refer to the two levels, the impact on IFAD's country programme and reputation; the impact on project's concrete outcomes.
* Economist Intelligence Unit

Annex 10: Exit Strategy

1. **The exit strategy** of the project is in-built from design and implementation. The implementation of the project will be done by RAB and through district teams and the private sector will be engaged from the earliest possible opportunity. The government entities are permanent structures that will be able to absorb support activities after the end of the project.
2. The interventions to be done by the project will be owned by the community organisations that will be supported to have the capacity to operate them. Users of the infrastructure will be involved from the studies, construction and operation and maintenance. Operation and maintenance manuals in the language best understood by the users will be prepared and the users trained. At the beginning of the construction, RAB will sign an implementation agreement with the potential users of the infrastructure that will clarify the roles and responsibilities of the parties.
3. Each irrigation scheme, borehole and valley bottom tank will be handed over to the users on partial completion of the works and a handover certificate will be issued at full handover. The handover certificate will also indicate the responsibilities of the government and the users during the operational phase.
4. The project will gradually withdraw from each intervention after the handover is done, but government agencies in extension, water resources management and natural resources among others, and the private sector will take over.
5. The project design is built on lessons learnt from recent IFAD-financed projects that have provided important insights which will be key to the project's sustainability and exit strategy.
6. The above approach and the sustainability factors mentioned below, will ensure a smooth, responsible and sustainable exit of project funded activities.
7. **Institutional sustainability**. The institutional development foreseen by KIIWP aims at gaining the user buy-in and satisfaction on which sustainability depends. Infrastructure management institutions like Sector- and District-level Steering Committees and Sub-Catchment Committees will play an active role in the design, construction and operation and maintenance of infrastructure supported by KIIWP. The sustainability of the water resource and irrigation schemes will be further enhanced by the 6 Water User Organizations and 35 Water for Livestock User Organizations to be strengthened and/or developed by the project.
8. **Social sustainability (Empowerment)**. The group-based approach has proven effective in supporting and involving the rural poor, whether engaged in on-farm or off-farm activities. Using Farmer Field Schools as a basis for smallholder farmers to become accustomed to working together and sharing knowledge and information will build trust over time and become a sustainable basis for them to establish more formal associations like WUOs and WLUOs, and cooperate in activities related to the production and marketing of their products. As for cooperatives, using long term coaching and mentoring support instead of one-off training will increase their chances of success and long term sustainability. The engagement of Business Development Service Providers who will act as an advocate for cooperative members engaging in contracts with other value chain actors will ensure that implementation is sensitive to the needs and concerns of the target households.
9. **Participation of the private sector**. In line with the Government of Rwanda's recognition that agricultural growth must be driven by investments of private actors,

KIIWP will involve private-sector entrepreneurs such as large-scale farmers, wholesalers, processors and exporters, as well as financial institutions operating at both local and national level. The delivery of water services, provision of agricultural advisory services, backward linkages to input suppliers and financial service providers, forward linkages to markets, and direct co-investments in post-harvest infrastructure are some of the key tools that will promote the development of mutually beneficial business relationships between KIIWP target groups and private stakeholders, and thus enhance the long term sustainability of the project's investments.

10. **Economic and financial sustainability**. The project's economic and financial analysis has established that the project will generate a positive return. The EFA shows that KIIWP is financially profitable for rural households engaged in agricultural production with financial internal rate of return for farmers ranging from 20 to 27% depending on the production system. The sensitivity analysis shows that the economic profitability of KIIWP would remain satisfactory even if the project costs increase by 50%, the project benefits decrease by 40% or if the benefits lag behind by two years.

11. **Environmental sustainability.** Good environmental stewardship is at the heart of the project success. Within KIIWP project, the integrated watershed management practices will consist of good integration between crop and livestock production, combined with the promotion of a wide range of cost-effective erosion control and water retention measures. In addition, the ecological sensitivity of the project area will require increased attention to good agricultural practices that farmers will be trained in. KIIWP environmental sustainability will be further enhanced by the adoption of adaptation and mitigation measures through good agricultural practices, water harvesting and climate-smart storage technologies, that will be determined according to specific site locations, size of irrigation schemes, and production systems. In irrigation schemes, solar energy to pump water will be considered to avoid the use of expensive and GHG emitting fossil fuels.

12. **Enabling policy environment.** The project will benefit from a highly enabling policy and institutional environment, with a series of new laws and policies coming into force that are fully supportive of the development of water infrastructure and cooperative development. Identified gaps in terms of operationalisation of new policies, laws, regulations and institutional framework will be addressed with KIIWP support. The achievement of policy and legislation frameworks that are conducive to the replication and dissemination of new experiences and achievements is an important element for sustainability, replicability and scaling up of KIIWP interventions.

Annex 11: Linkages between the core indicators in KIIWP, the IFAD Strategic Framework (2016 – 2025) and SDG targets

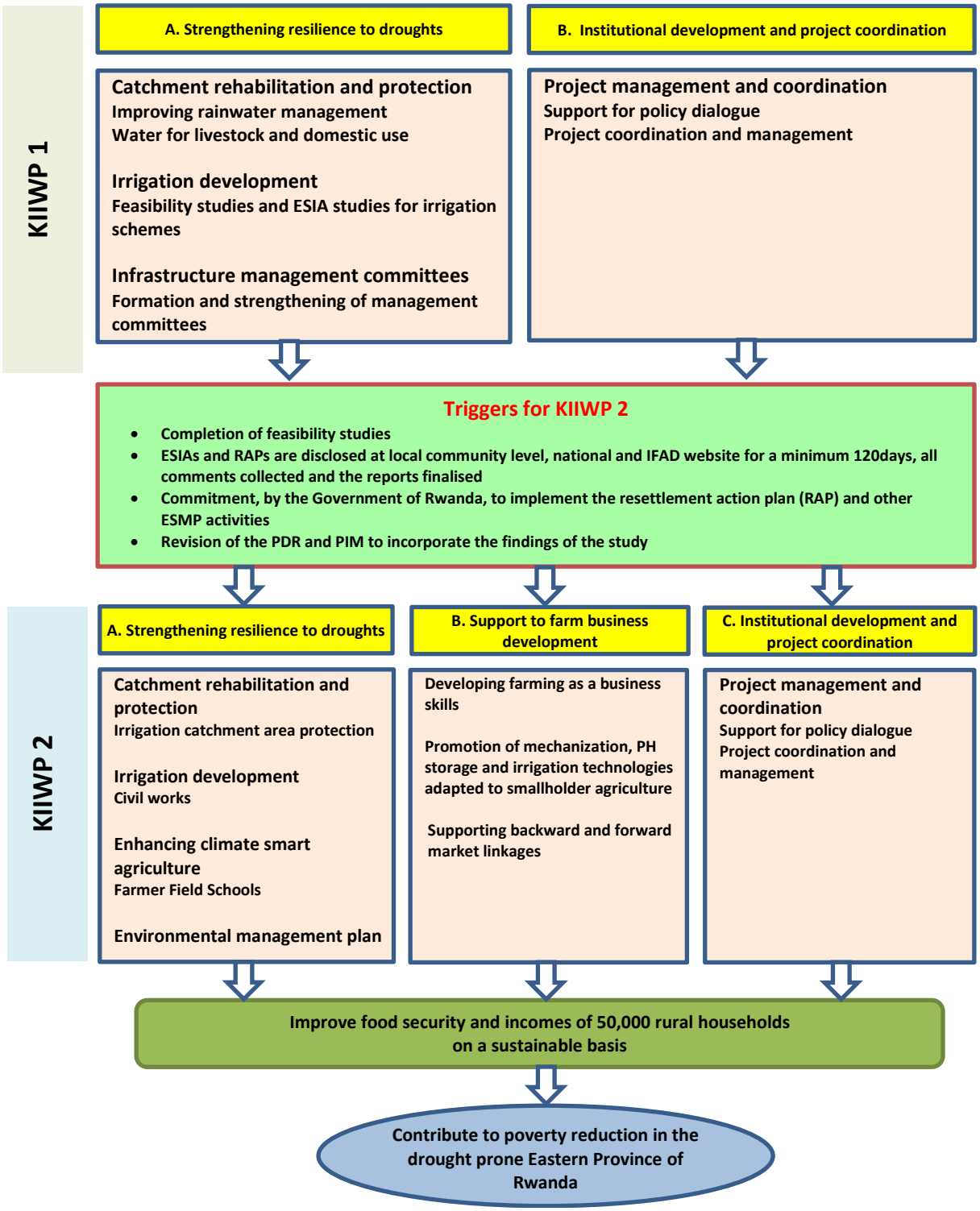
SDG	SDG target	IFAD Strategic Framework strategic objective (SO) and thematic area	KIIWP output/outcome core indicators
1 End poverty	1.4 - By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance	SO1 Increase poor rural people's production capacities: - *access to natural resources*	1.2.1* Number of persons reporting improved access to land, forests, water or water bodies for production purposes
		SO1 Increase poor rural people's production capacities: - *inclusive financial services*	1.1.6 Number of financial service providers supported in delivering outreach strategies, financial products and services to rural areas
2 Zero hunger	2.3 - By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment.	SO1 Increase poor rural people's production capacities: - *access to agricultural technologies and production services*	1.1.2 Number of hectares of farmland under water-related infrastructure constructed/rehabilitated
	2.1 - By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round.	SO1 Increase poor rural people's production capacities: - *nutrition*	1.1.8* Number of persons provided with targeted support to improve their nutrition
	2.2 - By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons		
	2.4 - By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality.	SO1 Increase poor rural people's production capacities: - *access to agricultural technologies and production services*	1.1.4* Number of persons trained in production practices and/or technologies
	2.4 - By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality.		1.2.4* Number of persons reporting increase in production

SDG	SDG target	IFAD Strategic Framework strategic objective (SO) and thematic area	KIIWP output/outcome core indicators
8 Decent work and economic growth	8.2 - Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour-intensive sectors	SO2 Increase poor rural people's benefits from market participation: - *rural producers' organisations*	2.2.5* Number of rural producers' organizations reporting an increase in sales
	8.3 - Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small- and medium-sized enterprises, including through access to financial services		2.2.3* Number of rural producers' organizations engaged in formal partnerships/agreements or contracts with public or private entities
13 Climate action	13.1 - Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries	SO3 Strengthen the environmental sustainability and climate resilience of poor rural people's economic activities - *environmental sustainability and climate change*	3.1.2* Number of persons provided with climate information services
	13.3 - Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning		3.1.1* Number of groups supported to sustainably manage natural resources and climate-related risks
15 Life on land	15.1 - By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements		
	15.3 - By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world		3.1.4 Number of hectares of land brought under climate resilient management

* Data collected disaggregated by sex and age to capture the results of gender and youth mainstreaming throughout project activities and contributing to SDG 5 on gender equality and women's empowerment.

Annex 12: Information on KIIWP 2

Figure 1: KIIWP 1 and KIIWP 2 by component



Component A: Strengthening resilience to droughts

Sub-component A.1: Catchment Rehabilitation and Protection

1. The catchment rehabilitation and protection of irrigation schemes will be done following the preparatory activities of sub-catchment planning and management committee development made under KIIWP 1.

Sub-component A.2: Irrigation Development

2. Irrigation development will depend on the identification of feasible irrigation sites by the studies conducted in KIIWP 1. After completion of the feasibility studies and full disclosure and approval of ESIAs, the irrigation schemes to be developed will be selected and submitted for financing. The GoR will apply for additional financing from IFAD for the development of 2,275ha. In addition, if the feasible area is bigger than 2,275ha, the GoR can approach other financiers for the development of the irrigation schemes.

3. The proposed irrigation infrastructure is made of two categories: i) irrigation in marshlands and neighbouring hillsides which will require dams to harvest enough water for off-season supplementary irrigation; and, ii) large pumped irrigation systems abstracting from either the various lakes in the district or directly from the Akagera River.

4. Potential results comprise: the Ndego Irrigation Scheme (net 1,400ha); Kibare Irrigation Scheme (net 600ha); Kanyeganyege Irrigation Scheme (net 150ha + Dam); Gishynda Irrigation Scheme (net 125ha + Dam). However, other irrigation schemes will be developed if these schemes are found to be unviable.

Sub-component A.3: Infrastructure management institutions

5. To date, none of the existing WUOs in the District have signed an Irrigation Management Transfer Agreement with the District. The aim will be that after scheme completion and fulfilling all conditions all WUOs and WLUOs in the District will ultimately sign an Irrigation Management Transfer Agreement (IMTA) with MINAGRI/RAB, which will be co-signed by Kayonza District authorities. The project will focus on preparing all WUOs and WLUOs, both existing and newly formed ones, to sign the IMTA before project completion.

Sub-component A.4: Enhancing climate smart agriculture practices and technologies

6. A long list of existing CSA practices and technologies will be compiled By RAB Crop Officers and Kayonza District and Sector Agronomists in liaison with expert partners. RAB researchers will test proposed CSA technologies with select farmers in the different areas to come up with the technologies and practices that work best under different environments/conditions and crops. Short-term international technical assistance will be sought to prepare training materials on best CSA practices and technologies, that will be selected and promoted in each KIIWP project area.

7. Training and demonstrations of CSA will be delivered through Farmer Field Schools and the establishment of demonstration plots on both rain-fed and irrigated land. The FFS curricula will be defined through a consultative process in which the farmers, the extension workers as well as the private sector have a say.

8. Promotion of good nutrition practices and support to household food security will raise awareness among communities of how to improve access to local foods and diversify

family diets. Emphasis will be put on children, pregnant and breastfeeding mothers and people with HIV and AIDS who are the most vulnerable to malnutrition. Short-term TA will be sought to develop a training module on basic nutrition education, which will be incorporated into the FFS training.

9. A Gender Action Learning System will be promoted to increase awareness of gender roles in the households and communities by improving their capacity to negotiate their needs and interests and find innovative, gender-equitable solutions in livelihoods planning and value chain development.

Sub-component A.5: Environmental Management Plan.

10. Environmental and social safeguards will be implemented in this sub-component.

Component B: Support to farm business development

Sub-component B.1: Developing Farming as a Business (FaaB) skills

11. Business advisory services. KIIWP will strive to assist farmers engaged in commercial production to acquire a better understanding of the market demands as well as to understand the gross margin calculations to assess profitability and plan production accordingly. A specific FaaB training module will be developed and incorporated in the FFS curriculum[51]. KIIWP 2 will ensure that RAB and District frontline staff and FFS Facilitators are systematically involved in this training to ensure a spill-over effect and sustainability beyond the project's life.

12. Business Development Service Providers (BDSPs) will be hired as coaches or mentors; they will support the project beneficiaries through dedicated ad-hoc assistance based on the specific challenges they meet, and along the different stages of the cropping seasons. The project will organize pre-season meetings for cooperatives[52], which will facilitate exchanges with prospective buyers, help farmers identify market demand and opportunities, and thus plan their production accordingly. Market exposure will be enhanced by the cooperatives' participation in trade fairs or agricultural shows.

13. The BDSPs will also facilitate marketing arrangements with traders, processors and/or major off-takers through improved communication and negotiation skills, market-based production programming and joint marketing.

14. Capacity building of cooperatives. Farmers supported through new irrigation or water for livestock schemes will be encouraged to join existing cooperatives or form new cooperatives that will be registered with the Rwanda Cooperative Agency (RCA). Building on support by RCA, the organizational and technical capacity of both new and existing cooperatives will be strengthened. In addition, KIIWP 2 will establish and develop cooperative linkages and partnerships with WUOs/WLUOs (through seasonal contracts), district and sector staff, RCA staff as well as other stakeholders. Where needed formal agreements or MoUs will be prepared and signed.

Sub-component B.2: Promotion of mechanization, post-harvest storage and irrigation technologies

15. In line with RAB mechanization programme initiated in 2009, KIIWP, through the FFS training, will sensitize farmers and cooperatives in using farm machinery in different farming operations. The project will also facilitate the linkages of cooperatives with farm machinery hiring services, by providing incentives for land preparation, hay

baling, fertilizer transport, etc. To scale-up access to modern irrigation technologies, the project will build on the support provided by the GoR to assist farmers' investments in simple, affordable and demand-driven Small-Scale Irrigation Technologies (SSIT).

16. Whenever possible, KIIWP will encourage the optimal use of drying grounds and warehouses already in place in Kayonza District. Particular emphasis will be given to strengthening the linkages between small-holder farmers and the cooperatives or companies that have already received co-financing support from the Post-harvest and Agribusiness Support Project to develop storage, processing or transport facilities in the maize and beans value chains. For new investments that may occur after PASP completion, or for other value chains that are not supported by PASP in Kayonza District (esp. rice), KIIWP will provide grant support using modalities similar to PASP project.

Sub-component B.3: Supporting backward and forward market linkages

17. KIIWP 2 will strive to improve access to and use of adequate financial services by the target population of Kayonza. Activities will revolve around two types of interventions: (i) strengthening of Community Based Finance Institutions and their active linkage to the cooperatives supported by KIIWP 2; and (ii) facilitating their access to agricultural insurance systems that can alleviate farming risks. In this process, KIIWP 2 will build on the existing agricultural lending products that have been developed in recent years.

18. Promotion of Agriculture Insurance Schemes. In 2017, the GoR moved towards the development of a National Agriculture Insurance Scheme recommends the implementation of a first phase supporting comprehensive risk insurance (MPCI – Multi Peril Crop Insurance) to cover yield losses due to non-preventable risks such as drought, flood, pests and diseases, etc. The project will seize this opportunity to support MINAGRI's technical support unit in piloting the first phase of the MPCI scheme for maize and beans VCs in Kayonza.

19. Public-Private-Producers Partnerships (4Ps). In the specific case of pumped irrigation systems that are intended to develop a highly commercial smallholder irrigated production system, 4P-like arrangements with the private sector will be developed whenever feasible. KIIWP will support small-scale farmers with irrigation water supply infrastructure, sensitization and cooperative institutional development, while neighbouring large-scale farmers will manage the production and delivery of irrigation water to smallholder farmers at a fee, ensure a reliable market for smallholder produce, and/or provide technical and farming-as-a-business advisory services in lieu of FFS and BDSPs.

20. Implementation arrangements. This component B will be implemented under the overall responsibility of the MINAGRI SPIU and the direct coordination and supervision of the Program Manager to be recruited. At SPIU level KIIWP will lean on the Nutrition Specialist and Farmer Organization Specialist recently hired by RDDP project, as well as the Market Support Specialist already assisting other ongoing IFAD-funded projects.

21. To complement the business development services provided by experienced coaches/mentors, young professional organisations, such as the Rwanda Youth in Agribusiness Forum, and the Horticulture in Reality Cooperative will be mobilized by the project as service providers whenever the need and opportunities arise, in both rain-fed and irrigated areas. Other specialized institutions identified as implementing partners include the Rwanda Cooperative Agency, NAEB (especially for horticulture export crops), the Ministry of Environment, and the Ministry of Health among others.

Component C: Institutional development and project coordination

22. This component is designed to strengthen government agencies to deliver project outputs and to support policy dialogue and institutional development that will sustain project interventions beyond project completion. To this effect, KIIWP has been integrated with the SPIU structure of RAB that is mandated to implement agricultural projects on behalf of MINAGRI. KIIWP 2 will continue the coordination activities initiated in the first phase at both SPIU and District level under sub-component C.1. In addition, as described below, KIIWP 2 will strengthen institutions that can support directly or indirectly the implementation of KIIWP and provide policy supports that are needed for the effective implementation of the project.

Sub-component C.1: Policy and institutional development

23. Support for policy dialogue will be provided by KIIWP through an evaluation of implementation and impact of new or existing policies related to the project activities with relevant national, and district level stakeholders. Below are concrete examples of policy discussion points that can be raised and addressed in multi-stakeholder platforms and fora of dialogue to be supported by KIIWP: Support to national policy on contract farming; Support national policy on issues of availability and quality of seeds, including multiplication.

24. Gender and youth mainstreaming. To ensure gender and youth mainstreaming into project activities and outcomes, RAB in connection with the SPIU will prepare a brief gender action plan and youth strategy, building on work already done by MINAGRI and other IFAD-supported projects. Specific training will be organised to familiarise government and project staff with gender and youth mainstreaming approaches, and special provisions will be made to ensure that gender equity concerns are adopted in the implementation of all project components. The M&E system will be gender and youth-disaggregated to support gender and youth assessments and analysis, and a peer learning group on gender will be established. The officer in charge of gender and youth in the SPIU will be specifically responsible for ensuring and overseeing the implementation of the gender action plan and youth strategy.

25. Capacity building interventions will be identified for KIIWP staff under the SPIU, including RAB and district personnel engaged in KIIWP implementation. These capacity building activities will be preceded by a needs assessment to be elaborated for the SPIU, RAB and district personnel. The financing of these activities will be done by the concerned entities and co-financed by the project, provided that these capacity building activities are benefiting KIIWP implementation and build the sustainability prospects of the project. Collaboration with the Rwanda Capacity Development and Employment Services Board (CESB) will be thus explored and pursued.

Sub-component C.2: Project coordination

26. This component focuses on providing the coordination arrangements including the financial and human resources for the implementation of the project.

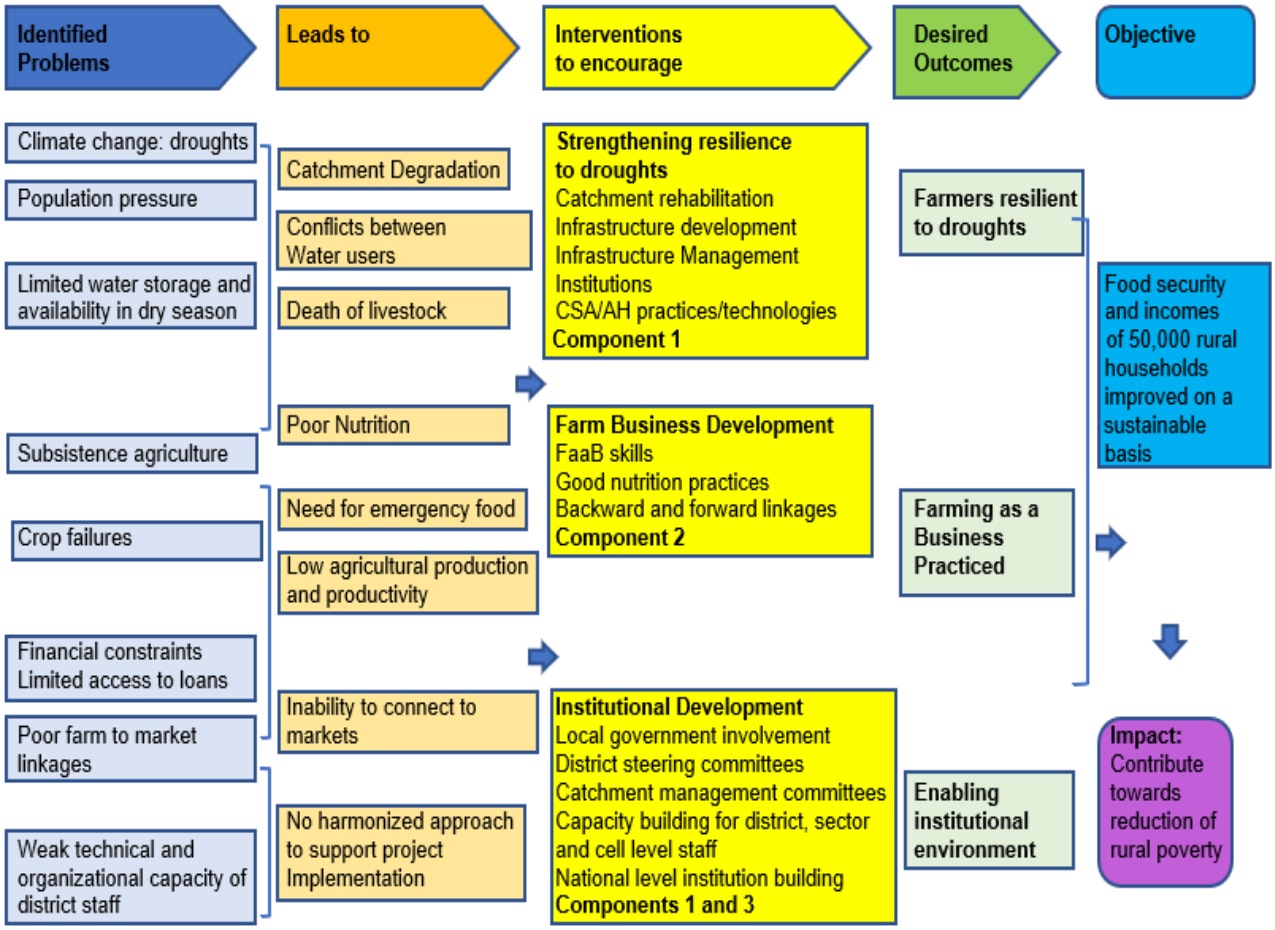
Lessons learned

27. The country loan portfolio provides various lessons learned for the design of KIIWP 2:

    1. Cooperatives, farmer organisations capacity building: whilst several cooperatives were either formed or rehabilitated, and supported, they continued to face organizational and governance issues. Further comprehensive and tailored capacity building is required for these institutions. This is precisely what KIIWP foresees to provide under component B (Support to Farming Business Development) during KIIWP 2.

2. Development of farmer's organisational capacity to participate in markets through public-private-producer partnerships is essential but to be successful, formation of 4Ps requires proper diagnostic assessment of key public and private actors and their capacities to foster partnerships from the outset. PASP experience demonstrates that when commercial linkages between farmers and buyers are formalized and trust is built, off-takers can become co-investors with farmers and instrumental to help them access financial services and other market and product quality information that are needed to add value and grow their businesses to scale.
3. In Kayonza District, PASP has supported the development of seven hubs related to the dairy, maize and bean value chains. These hubs are instrumental in terms of provision of training and business advisory services, advancement of farmer cooperatives, construction/rehabilitation of post-harvest infrastructures, creation of market linkages, engagement of private sector and access to financial services. In order to ensure sustainability, capacity building and hub development need to systematically involve District and sector level staff and local leaders. A ToT on hub development, business development and 4P arrangements needs to be organized with participation of all these actors.
4. The potential of horticulture to contribute actively to Rwanda's export diversification has been demonstrated in the last few years. It is also a labour-intensive industry characterized by high incomes per square meter and quick returns on investments, two aspects that are of vital importance in the context of Rwanda's land-scarce resources. Additionally, it is likely to attract youths who typically cannot access much land and are particularly interested in quick wins. Besides economic receipts and jobs, other horticulture related benefits include improving people's nutritional situation, encouraging public-private-producer partnerships in horticulture-related industries, and promoting Rwanda's attractive agro-climatic conditions.
5. Limited access to financial services remains a key bottleneck for smallholder farmers to graduate from subsistence farming to commercial farming. PRICE-supported performance-based grant scheme has proven that horticulture is a bankable sector and it attracted 35 Financial Institutions including Microfinance Institutions, Savings and Credit Cooperatives, Microfinance banks, Commercial Banks and the Rwanda Development Bank.

Table 1: Theory of change for KIIWP 1 and KIIWP 2



Anticipated Financing Plan for KIIWP 2

46. The project will be financed by: (i) IFAD up to USD 25.7 million (43.4%), through a highly concessional loan; (ii) Private sector for USD 322 thousand (0.5%); (iii) ICCO for USD 246 thousand (0.3%), (iv) Government of Rwanda for a total of USD 8.8 million (15%) in the form of tax exemptions; (v) Co-financiers for a total of USD 22 million (37.3%); and (vi) Beneficiaries for USD 2 million (3.4%). See Tables 2 and 3 for details.

Table 2: Financing Plan by Components for KIIWP 2 (US$ 000)

	Beneficiaries		IFAD		Co-Financiers		The Government		Total	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
A. Strengthening resilience to droughts										
1. Catchment rehabilitation and protection structures	-	-	4,667.9	31.6	7,457.1	50.4	2,661.6	18.0	14,786.5	25.0
2. Irrigation Development	249.7	1.0	8,249.8	32.4	12,419.0	48.8	4,537.0	17.8	25,455.6	43.0
3. Infrastructure Management Institutions	-	-	84.8	97.7	-	-	2.0	2.3	86.8	0.1
4. Enhancing climate smart agriculture practices and technologies	-	-	2,465.8	49.3	2,193.3	43.8	346.9	6.9	5,006.0	8.5
5. Enviromental and Social Management Plan	-	-	1,770.3	92.6	-	-	140.8	7.4	1,911.1	3.2
Subtotal Strengthening resilience to droughts	249.7	0.5	17,238.6	36.5	22,069.4	46.7	7,688.3	16.3	47,246.0	79.8
B. Support to farm business development										
1. Developing Farming as a Business skills	20.7	2.5	749.1	90.3	-	-	60.0	7.2	829.8	1.4
2. Promotion of mechanisation, post-harvest storage and irrigation technologies	1,761.7	39.5	1,518.6	34.0	-	-	961.1	21.5	4,464.0	7.5
3. Supporting backward and forward linkages	-	-	2,451.3	83.2	-	-	164.6	5.6	2,947.8	5.0
Subtotal Support to farm business development	1,782.4	21.6	4,719.1	57.3	-	-	1,185.7	14.4	8,241.7	13.9
C. Institutional Development and Project Coordination										
1. Institutional Support	-	-	75.0	100.0	-	-	-	-	75.0	0.1
2. Program Management and Coordination	-	-	3,667.4	100.0	-	-	0.0	-	3,667.4	6.2
Subtotal Institutional Development and Project Coordination	-	-	3,742.4	100.0	-	-	0.0	-	3,742.4	6.3
Total PROJECT COSTS	2,032.1	3.4	25,700.0	43.4	22,069.4	37.3	8,874.1	15.0	59,230.0	100.0

Table 3: Expenditure Accounts by Financier for KIIWP 2 (US$ 000)

	Private sector		ICCO		Beneficiaries		IFAD		Co-Financiers		The Government		Total	
	Amount	**%**	**Amount**	**%**	**Amount**	**%**	**Amount**	**%**	**Amount**	**%**	**Amount**	**%**	**Amount**	
I. Investment Costs														
EQUIPMENT & MATERIALS	222.6	5.0	-	-	1,630.5	36.6	1,292.7	29.0	295.9	6.6	1,016.5	22.8	4,458.1	
GOODS & SERVICES & INPUTS	92.5	2.1	35.4	0.8	20.7	0.5	2,140.7	48.7	1,444.7	32.9	658.9	15.0	4,392.9	
WORKS	-	-	-	-	-	-	12,917.6	32.3	19,876.1	49.7	7,198.6	18.0	39,992.4	
VEHICLES	-	-	-	-	-	-	-	-	-	-	-	-	-	
CONSULTANCIES	-	-	-	-	-	-	1,506.7	96.8	50.6	3.2	-	-	1,557.3	
TRAINING & WORKSHOPS	-	-	187.3	5.3	-	-	2,926.3	83.2	402.1	11.4	0.0	-	3,515.8	
GRANTS & SUBSIDIES	-	-	-	-	-	-	1,098.6	100.0	-	-	-	-	1,098.6	
Total Investment Costs	315.0	0.6	222.7	0.4	1,651.2	3.0	21,882.6	39.8	22,069.4	40.1	8,874.1	16.1	55,015.0	
II. Recurrent Costs														
SALARIES & ALLOWANCES	-	-	16.7	0.5	-	-	3,533.6	99.5	-	-	0.0	-	3,550.2	
OPERATING COSTS	-	-	-	-	380.9	57.3	283.9	42.7	-	-	0.0	-	664.8	
Total Recurrent Costs	-	-	16.7	0.4	380.9	9.0	3,817.4	90.6	-	-	0.0	-	4,215.0	
Total PROJECT COSTS	315.0	0.5	239.4	0.4	2,032.1	3.4	25,700.0		43.4	22,069.4	37.3	8,874.1	15.0	59,230.0

Overall Economic and Financial Analysis KIIWP1 and KIIWP2

Introduction

1. This Annex lays out the methodology, assumptions and results of the economic and financial analysis carried out to assess the impact and viability of the Kayonza Irrigation and Integrated Watershed Management Project (KIIWP). The aim is to identify, calculate and compare project costs and benefits and thereby assess its viability, first from the point of view of individual participants in the project (financial analysis) and then from the standpoint of the national economy as a whole (economic analysis).

2. The analysis considers the KIIWP as a whole since activities financed in both phases will generate the expected benefits.

Project benefits and beneficiaries

3. **Benefits.** KIIWP's development objective is to improve food security and incomes of rural households on a sustainable basis. Project interventions are expected to result in an extensive range of tangible and intangible benefits. Key quantifiable benefits include: (i) increased value of agricultural production in marshlands; (ii) crop diversification and increased value of production in hillside areas; (iii) reduced post-harvest losses and increased sales in output markets; (iv) increased value of livestock production; (v) improved access to water for domestic uses. These benefits will be achieved through project interventions such as: (i) water infrastructure development; (ii) promotion of climate smart agriculture and land husbandry practices; (iii) capacity building for farmers to access markets for agricultural inputs, finance and outputs; (iv) promotion of sustainable land and water management practices.

4. **Beneficiaries**. The project will be implemented in eight drought prone sectors of Kayonza District. It is anticipated that the total number of households benefiting directly from the project during the six years will be 28,000, of which 50% of beneficiaries will be women. Farmers and rural households in the project area will also benefit indirectly from project activities through increased demand for farm labour, clustering and value chain linkages and nutrition-related outcomes. Table 1 below provides an overview of direct project beneficiaries form different interventions in the project lifespan.

5. **Adoption rates.** This analysis uses the total number of direct beneficiaries and estimates that 76% of farm-enterprises and 77% of non-farm enterprises will adopt the project interventions and activities. These adoption rates are reflected in Table 1.

Table 1: Number of households benefiting directly from KIIWP activities

Number of direct beneficiaries			**Phasing per Calendar Year[53]**							
Target groups		target HH	**Y 1**	**Y 2**	**Y 3**	**Y 4**	**Y 5**	**Y 6**	**Y7**	**Total**
Farm-enterprises	***target[54]***	***25393***								
adoption rate		76%	0%	9%	20%	33%	16%	10%	12%	**100%**
no. of HH	100%	**19299**								
Hillside farms	74%	14281	0	1282	2927	4756	2232	1379	1706	**14281**
Marshland farms	26%	5018	0	450	1028	1671	784	484	599	**5018**
cumulative no. of HH		19299	0	1732	5687	12114	15130	16993	19299	
Non-Farm-enterprises	***target***	***2500***								
adoption rate		77%	0%	43%	57%	0%	0%	0%	0%	**100%**
no. of HH	100%	**1928**								
Livestock and domestic	100%	1928	-	829	1,099	-	-	-	-	**1928**
cumulative no. of HH		1928	-	829	1,928	1,928	1,928	1,928	1,928	
Total Project Target HHs	***target***	***27893***	-	2,561	7615	14,041	17,058	18,921	21,226	
Total beneficiaries in project supported HH		*125,519*	-	*11,523*	*34,266*	*63,187*	*76,759*	*85,144*	*95,518*	
persons per HH	4.5									

[53] Project duration is 6 years. Phase I is planned to start in last quarter of 2019 and Phase II is planned to finish in the last quarter of 2025, making it 7 calendar years.

[54] Target farm enterprises have been calculated based on the direct beneficiaries of project investment areas.

Financial Analysis

Methodology

6. The methodology follows recent IFAD guidelines on Economic and Financial Analysis (EFA)[55] that recommend the use of cost-benefit analysis which is based in the valuation in monetary terms of project cost and benefits. The financial analysis is only applied to the project activities that lend themselves to it and where sufficient data are available. The analysis builds on primary and secondary data collected by the design team during the first design mission in April/May 2018. Information was obtained through field visits, interviews with government officials, farmers groups and stakeholders as well as from other on-going IFAD projects (e.g. KWAMP, PASP, PRICE, RDDP) and World Bank Projects (LWH, RSSP) in the country. Conservative assumptions were made both for inputs and outputs.

7. The financial analysis has been undertaken from the point of view of a rural household engaged in agricultural production and livestock (dairy) management activities. The analysis aims first at assessing the financial profitability of representative production models. It should be noted that the financial models have been developed solely for the purpose of the EFA analysis, as in practice farm's characteristics usually change from one place to another.

Financial models

8. A total of eight crop budgets have been prepared to assess farm productivity, gross margins and returns to labour for rice, maize, beans, eggplant, green pepper, onion and tomato. Furthermore, livestock models for cows were also prepared. The incremental benefits have been estimated as the difference between a "without project (WoP)" and a "with project (WP)" scenario.

9. **Crop budgets.** The "WoP" is characterized by traditional subsistence farming with low yields, low technology adoption and high post-harvest loss rates. Besides, farmers face particular difficulties in marketing like production planning, bulking, transport, steady flow of marketable produce and buyer identification and negotiations.

10. In the "WP", farmers are expected to increase productivity (including more production cycles) and decrease post-harvest losses, due to trainings in GAP, producer coaching, introduction of irrigation, connection to markets. Furthermore, the farmers are assisted in gradually transforming their crops from traditional staple crops to higher value cash crops. The adoption of good agricultural practices involves also the sustainable management of land and water.

11. Revenues are formed of agro-products sales and operational costs are mainly seeds, fertilizers, chemicals and labour. Investments are mainly in small scale irrigation technologies[56]. Several aspects have been included in the crop budget analysis:

    a) Labour is a combination between family and hired. The hired labor has been valued at RWF 1000 per day. For unpaid family labor a daily rate of RWF 750 is used as the financial cost[57].

    b) Home consumption for maize, beans and rice is estimated in the models to assess the impact on food security and marketable surplus to the beneficiaries. Agriculture production used for self-consumption is not valued in monetary terms.

[55] IFAD's Internal Guidelines for Economic and Financial Analysis of Rural Investment Projects

[56] The investment cost in SSIT is subsidized at 50%.

[57] The calculation of family labor wage rate is based on World Bank (2014) Transformation of Agriculture Sector Program Phase 3.

c) Prices reflect those actually paid at farmgate. It is also assumed that market demand is healthy for all analysed crops and that all marketable surplus from local producers can be readily absorbed in the main markets without adverse effects on the market price.

d) It is assumed that productivity increases related to yield improvement and reduced post-harvest losses will happen gradually, reaching its full value at the end of the project.

12. Maize, beans, and rice budgets have been developed to represent the current situation in the field. Table 2 shows post-harvest yields, self-consumption, total revenues, total operating costs, net income and the return to labour for the crops considered. The data presented are for 1-hectare representative cultivation area. The with-project information presents data for the project once it has reached its full development in year 5. Data for rice is presented for one growing season. This crop is normally grown for two seasons within a year. The negative values of net income under the WOP scenarios for maize and beans stem from the valuation of the financial costs of family labor [58]. Existing average yields are also quite low given the rainfed and poor management conditions under which these two crops are grown.

13. Table 3 presents similar information for the remaining crops budgets (vegetables), which are part of the focus commodities short-listed for this project. Most of these crops are grown in very limited amounts due to the existing farmer's orientation to staple crops.

[58] Furthermore, self-consumption has not been valued in monetary terms.

Table 2: Main indicators from crop budgets: rice, maize and beans.

		Rice (per season)			Maize			Beans		
Crops budgets- per ha	Unit	WoP	Wp*	Incremental	WoP	Wp*	Incremental	WoP	Wp*	Incremental
Post-harvest yield	kg	2,850	5,850	105%	1,275	4,140	225%	600	2,250	275%
Self-consumption	kg	250	500	100%	250	500	100%	250	400	60%
Total Revenues	'000 RWF	741	1,524	106%	255	828	225%	112	592	429%
Total Operating Costs	'000 RWF	585	765	31%	399	607	52%	402	584	45%
Net Income	'000 RWF	155	759	389%	(144)	220	253%	(290)	7,2	102%
Return to Labour	RWF/p-d	330	1405	326%	-	802	n/a	-	25	n/a

* Values at full development

Table 3: Main indicators from crop budgets: vegetables.

		Tomato			Onion			Green Pepper			Eggplant		
Crops budgets- per ha	Unit	WoP	Wp*	Increm.	WoP	Wp*	Increm.	WoP	Wp*	Increm.	WoP	Wp*	Increm.
Post-harvest yield	ton/ha	11.25	13.5	20%	11.25	13.5	20%	9.0	10.8	20%	11.25	13.5	20%
Self-consumption	kg	-	-	n/a	-	-	n/a	-	-	n/a	-	-	n/a
Total Revenues	'000 RWF	3,375	4,050	20%	4,500	5,400	20%	4,500	5,400	20%	2,813	3,375	20%
Total Operating Costs	'000 RWF	1,689	1,689	0%	1,606	1,606	0%	1,246	1,246	0%	1,236	1,236	0%
Net Income	'000 RWF	1,686	2,361	40%	2,894	3,794	31%	3,254	4,154	28%	1,576	2,139	36%
Return to Labour	RWF/p-d	3088	4325	40%	4729	6200	31%	8301	10597	28%	4021	5456	36%

* Values at full development

14. **Farm Models.** On the basis of the above listed crop budgets, the existing growing conditions and production arrangements in the country, two different farm enterprise models, with an average land of 0.3 hectares, have been developed:

a) Hillside area farming. In the WOP situation, farmers grow mainly traditional maize, beans and a very small area of vegetables. This farming is highly dependent on rain and subject to soil erosion, resulting in low crop yields. Interventions promoted such as the terracing, water storage and the promotion of best agricultural practices will have an impact both on crop yields and the cropping patterns. The WP situation establishes a decreasing allocation of land for maize and beans and an increased cultivation of vegetables. It is expected that about 12,990 households cultivating in hillsides will benefit from the project, based on a 76% adoption rate.

b) Marshland area farming. In the WOP situation, farmers grow paddy rice which exhibits low yields. Land used for cultivation is below its potential given existing water shortages. This is the case for the two growing cycles of rice during the year. Interventions such as irrigation infrastructure development, the promotion of sustainable water management, agricultural practices and access to post-harvest infrastructure will result in increased yields and an increased cultivation area of rice in both growing seasons. It is expected that about 6,872 households cultivating in hillsides will benefit from the project, based on a 76% adoption rate.

15. A summary of the crop pattern for each farm model is presented in Table 4, below.

Table 4: Assumed Representative Farm Cropping Pattern Without- and With Program

Hillside- Representative Farm					**Marshlands Representative Farm**				
Share of farm area	**WOP**		**WP**		**Share of farm area**	**WOP**		**WP**	
	%	**ha**	**%**	**ha**		**%**	**ha**	**%**	**ha**
Maize	65%	0.195	35%	0.105	Rice	70%	0.21	100%	0.30
Beans	31%	0.093	10%	0.030	**Total**	**70%**	**0.30**	**100%**	**0.30**
Eggplant	1%	0.003	9%	0.027					
Green pepper	1%	0.003	15%	0.045					
Onion	1%	0.003	12%	0.036					
Tomato	1%	0.003	19%	0.057					
Total	**100%**	**0.30**	**100%**	**0.30**					

16. **Financial model results.** A financial discount rate of 17% was used based on the actual lending rates of commercial banks[59]. The two models show positive net present value (NPV) and financial internal rate of return (FIRR). Table 5 presents the expected financial benefits. Indicators selected include net income at full development after labour, FIRR and NPV. It is understood that such net incomes may not be achieved in one year; thus a gradual and conservative achievement of the expected benefits has been used in the analysis. Hillside farms have a small negative net income in the WOP situation which stems from the inclusion of family labour costs of producing low return crops such as maize and beans. Results suggest a move to producing less traditional

[59] National Bank of Rwanda (2018). Commercial Bank lending rates in 2017.

crops, especially maize and beans with a low net income to more profitable and higher value vegetable crops, which can have a significant positive impact on Farm HHs.

Table 5: Farm Models financial results.

Farm enterprise type	Net income (RWF) after labour			NPV (RWF) @17%	NPV (USD)60 @17%	FIRR
	WOP	*WP*[1]	*Increm.*			
Hillside Farm	(26,869)	565,123	2203%	$233,447	$273	20.57%
Marshland Farm	188,213	479,619	155%	$266,390	$311	27.32%

17. **Livestock model.** The project does not invest directly in livestock production activities. The major constrains hampering the development of this activity in Kayonza District is the lack of water, which affects also the availability of enough quantity and quality of pastures. However, the project does involve the construction of boreholes, which will improve access to water for livestock. Greater water availability is expected to increase the existing low productivity of cows. The financial analysis considers the benefits associated with milk productivity increases for cows. In the WOP situation, cows exhibit low milk production. Households are also assumed to make limited use of inputs given the existing low returns. The WP situation represents a gradual increase in milk productivity accompanied with greater input uses. It is expected that about 1,700 households will benefit from the project, based on a 77% adoption rate. Table 6 shows milk production yields, self-consumption, total revenues, total operating costs, net income and the return to labour for the crops considered. The data presented are for 1-hectare representative cultivation area. The with-project information presents data for the project once it has reached its full development in year 5. From the estimation of the livestock model, the additional value of milk production associated with the project amounts to RWF191,440 per year and a net present value of US$749, assuming a 10 year period of benefit stream and a 17% discount rate[61].

Table 6: Financial results for livestock enterprise models

		Livestock		
Livestock budgets- per ha	Unit	WoP	Wp*	Incremental
Milk production	liters	1,450	3,800	162%
Self-consumption	liters	435	1,140	162%
Total Revenues	RWF	161,385	422,940	162%
Total Operating and Labor Costs	RWF	133,500	231,500	73%
Net Income	RWF	27,885	191,440	587%
Return to Labour	RWF/p-d	309.8	2127	587%
NPV @ 17%	RWF	-	640,293	-
NPV @ 17%	USD	-	749	-

18. **Improved access to water.** The construction of boreholes by the project will save rural households from fetching water at a distance, even during the dry season. This time saved can now be used for other activities. On average, households use

[60] Exchange rate used is 1USD-855RwF, based on National Bank or Rwanda, May 2018.

[61] No FIRR has been calculated since households will not bear the costs of borehole construction.

eight jerricans of water (20 liter-jerricans) each day for domestic purposes. They normally fetch from streams or other distant boreholes. The time spent while going to fetch the water was estimated at 60 minutes. One person would only carry one jerrican at a time. Thus, each household on average requires 480 minutes to fetch water daily, i.e., eight hours. This can be value according to the wage rate of RWF 1,000. An additional RWF80 must be added to incorporate the price of borehole water (sold at RWF10 per jerrican). Overall, this translates to RWF394,200 of benefits per year per household and a net present value of US$2,148, assuming a 10-year period of benefit stream and a 17 per cent discount rate[62]. It is expected that about 1,700 households will benefit from the project, based on a 77% adoption rate.

Economic Analysis

19. The economic analysis aims to assess the viability of the proposed project from the standpoint of the society as a whole. It is based on the aggregation of individual incremental net benefits calculated through the models developed in the financial analysis, subject to adjustments highlighted hereafter and in accordance with the targets set in the logical framework.

Methodology and assumptions

20. The economic analysis is predicated on the comparison of the with-project situation to the without-project situation to measure the incremental benefits arising from the project. The methodology used is the cost-benefit analysis at shadow prices that better reflect the economic value to society of goods and services, often referred to as "economic opportunity costs" or "social opportunity costs". The analysis has been carried out for a 30-year period, corresponding to the likely life period of the benefits expected from the major infrastructure investments of the project. The scenario presented in the economic analysis is conservative, the analysis presented below is indicative and demonstrates the scope of profitability originated from the conditions prevailing at the time of the preparation.

21. **Discount rate.** In keeping with IFAD guidelines, a 12% discount rate has been used to reflect the social opportunity cost of capital in Rwanda. This rate corresponds to the yield on the five-year government bonds in 2017 (National Bank of Rwanda)[63].

22. **Standard conversion factor**. The analysis has been done in domestic currency at domestic price level. A shadow exchange rate of 788 RWF for 1 USD has been used to reflect the opportunity cost of foreign exchange to the country. It has been calculated on the basis of data from the World Bank (WITS)[64] according to the following formula:

$$SER = OER \times \{[(M+TM)+(X-TX)]M+X\} = OER\ x\ SCF$$

SCF= SER/OER

where SER: Shadow Exchange rate

OER: Official Exchange rate

M: Total imports (an average of five years would be advisable)

X: Total Exports (an average of five years would be advisable)

TM: Duties on Imports

TX: Export Taxes

SCF: Standard Conversion Factor

[62] No FIRR has been calculated since households will not bear the costs of borehole construction.

[63] National Bank of Rwanda (2018) Interest rate structure year 2017. Kigali.

[64] https://wits.worldbank.org/CountryProfile/en/Country/RWA/Year/LTST/Summary.

23. The financial prices and the streams of costs and benefits have been converted into economic values, by removing taxes, subsidies and other transfers. A standard conversion factor of 0.92 has been calculated according to the formula above, to all traded goods and services; for the non-tradable goods the conversion factor applied is equal to 1. The economic prices of hired labour costs were adjusted based on conversion factor of 0.8 to account for the unemployment rate in rural areas[65]. For equipment, a conversion factor of 0.8 has also been retained to take into account taxes embodied in the financial prices. All models are expressed in 2018 constant prices. The analysis builds on primary data collected by the design team during the first design mission in April/May 2018, provided by the Government of Rwanda and derived from other on-going IFAD projects (e.g. KWAMP, PASP, PRICE, RDDP) and World Bank Projects (LWH, RSSP) in the country. Conservative assumptions and parameters have been applied, in order to avoid over-estimation of benefits and provide realistic results.

Economic costs and benefits

24. The project economic costs have been generated with Costab software which deducts the amounts pertaining to taxes and provisions for price contingencies from the financial costs and applies the shadow exchange rate to convert the cost portion in foreign exchange into local currency. The three project components have been accounted for in the computation of the total economic cost. However, in order to avoid double counting, the amounts regarding the investments already taken into account in the financial models have been deducted from the total project cost. The deduction was made directly in the Costab before computing the economic costs

25. The economic benefits accounted for in the calculation of economic profitability indicators are those that are readily quantifiable, deriving from increased value of agricultural production, increased production of milk, and the value of improved access to water for domestic uses.

26. The models developed in the financial analysis have been transformed into economic values using economic prices instead of financial prices as stated above. The total incremental economic benefits for each model have then been computed by multiplying the individual incremental economic benefits to the number of beneficiaries that are expected to adopt the improved practices proposed by the project. To take into account the fact that adoption of new practices and infrastructure construction is likely to be gradual the following cumulative adoption rates have been assumed.

Table 7 Expected cumulative adoption rates

	Phasing per Project Year						
	Y 1	**Y 2**	**Y 3**	**Y 4**	**Y 5**	**Y 6**	**Y 7**
Farm- enterprises	0%	9%	29%	63%	78%	88%	100%
Livestock and domestic	0%	43%	100%	100%	100%	100%	100%

27. The total project incremental benefits have then been calculated by summing up the aggregate incremental economic benefit pertaining to each model. Finally, the stream of economic costs (computed using Costab) have been deducted from the stream of total incremental economic benefits to get the stream of net incremental benefits, so as to compute the economic IRR and NPV.

Economic results and sensitivity analysis

[65] Source: Labour Force Survey 2016 Report, National Institute of Statistics of Rwanda.

28. **Net Present Value (NPV) and Economic Internal Rate of Return (EIRR).** The net present value of the project over a thirty-year period is calculated to be 12,525 (USD '000) at an economic discount rate of 12% and the economic internal rate of return is estimated to be 19.32%. The summary of the economic analysis is presented in table 9 in this annex. The Project is therefore profitable from an economic standpoint. This result is quite satisfactory, especially as some benefits have not even been taken into account in the calculations due to data shortages. These include the improvement of living conditions and nutrition, the positive spill-over effects of capacity building on the local economy (suppliers of inputs, equipment, services), especially for women and youth.

29. **Sensitivity analysis:** A sensitivity analysis was conducted to assess the changes in NPV and EIRR due to variations in the future stream of benefits and costs, and delay in project implementation. The Project remains profitable under a wide range of project scenarios. Switch values for the reduction in benefits and increase in costs are 38% and 59% respectively. Table 8 presents the sensitivity analysis results.

Table 8: Sensitivity analysis results

		ERR	NPV
Base scenario		19.3%	18,914
Project benefits	-10%	17.0%	12,874
Project benefits	-20%	14.7%	6,833
Project benefits	-50%	7.4%	-11,287
Switch value	-31%		
Project costs		17.2%	14,765
Project costs	20%	15.4%	10,616
Project costs	50%	11.5%	-1,830
Switch value	46%		
1 year lag in ben.		16.0%	12,105
2 years lag in ben.		13.8%	6,025

Table 9: Economic analysis (USD)

Project Economic Analysis - Full Project Cost
(constant 2018 values)

(US$ 000)	PY1	PY2	PY3	PY4	PY5	PY6	PY7	PY8	PY9	PY10	PY30
Total Programme Net Benefits	-	982	3,078	5,966	7,978	9,631	10,579	11,065	11,297	11,333	11,333
Programme Costs											
Investment Costs	3,956	7,218	4,541	10,916	19,055	11,352	2,036	-	-	-	-
Recurrent Costs	160	520	670	977	997	1,012	733	425	425	425	425
Total Programme Costs	4,116	7,738	5,211	11,893	20,052	12,364	2,769	425	425	425	425
Total Project Incremental Net Benefits	(4,116)	(6,756)	(2,133)	(5,928)	(12,074)	(2,733)	7,810	10,640	10,872	10,908	10,908
EIRR	**19.32%**										
NPV @12% (USD 000)	12,525										

Note: Further details are provided in the excel file KIIWP_EFA_0512_v2.

Annex 13: Partnerships foreseen in KIIWP 2

1. ***MINAGRI*** will maintain an oversight role and lead the policy interventions and dialogue for the sector in general and for KIIWP implementation in particular. The Permanent Secretary in MINAGRI will maintain the role of Chair within the steering committee of KIIWP.

2. ***IFAD-funded "Climate Resilient Post-Harvest and Agribusiness Support Project" (PASP)*** is implemented in Kayonza too and as of April 2018, a total of 16 entities (of which nine cooperatives) had their business plans already co-financed by PASP in the maize and beans value chains. Ten of these projects led to the construction/rehabilitation of warehouses, five related to drying/milling equipment, and one to maize and beans transportation KIIWP will ensure beneficiaries are connected to these structures, and build on lessons learned on post-harvest management, cooperatives capacity building and forage production.

3. ***IFAD-funded Rwanda Dairy Development Program (RDDP)*** is operational in 12 districts of four Provinces of Rwanda: East (Nyagatare, Rwamagana, and **Kayonza**), North (Gicumbi, Burera, and Musanze), West (Nyabihu, Rubavu and Rutsiro) and South (Nyanza, Huye, and Ruhango). It focuses on developing the dairy value chain through improving cattle productivity, milk quality and processing capacity of the dairy industry, and strengthening the policy and institutional framework for the sector. Synergies will be created in Kayonza District, especially in dairy development and water for livestock.

4. ***IFAD-funded Project for Rural Income through Exports (PRICE)*** is a country-wide project focusing on the establishment of pro-poor cash crop value chains involving smallholder production and early transformation in partnership with private operators. Under KIIWP, synergies will be established under the development of horticulture value chains for both domestic and export markets.

5. ***Access to Finance Rwanda (AFR)*** has the core objective of stimulating the development of the financial sector in Rwanda. AFR's intention is to remove the systemic barriers that hinder access to financial services by putting the low income people particularly the rural poor and women at the centre of its interventions. AFR supports the development and provision of financial services including savings, credit, insurance, payments and remittances. AFR is funded by the UK Department for International Development (DFID,) Sweden, the United States Agency for International Development (USAID), the MasterCard Foundation and KfW Development Bank. For KIIWP implementation, collaboration with AFR would be explored in policy dialogue in rural finance and for specific instruments that are relevant for KIIWP implementation.

6. ***ICCO Cooperation:*** The newly launched 'Strengthening African Rural Smallholders' (STARS) programme is a five-year initiative of ICCO to support 210,000 farmers (50% women) in rural Ethiopia, Burkina Faso, Rwanda and Senegal to access appropriate financial products and agricultural services. Strong areas of collaboration with ICCO have been identified. For more details, please see Annex 4 under Component B.

7. ***Business Development Fund (BDF):*** Established in 2011 as a wholly owned subsidiary of the Development Bank of Rwanda (BRD), BDF has the objective of assisting SMEs to access finance, particularly those without sufficient collateral to obtain credit from traditional financial institutions at reasonable rates. For KIIWP implementation, collaboration with BDF could be explored, especially with the

Guarantee Fund and matching grant schemes currently managed by BDF and financed by PASP, PRICE and RDDP.

8. ***Rwanda Cooperative Agency (RCA)*** promotes, regulates and supervises the grouping of many smallholders into more effective market-oriented cooperative organizations. RCA was created through Law n° 16/2008 of 11.06.2008 which is strongly related with Law n° 50/2007 of 18.09.2007 adopted by the Parliament to determine the establishment, organization and functioning of Cooperative Organizations in Rwanda. RCA is in charge of several activities connected with the creation and supervision of cooperatives including: registering, regulating and supervising cooperatives; setting standards and formulating professional ethics for prudent management; assisting with capacity building through training and seminars; encouraging the cooperative movement to take advantage of investment opportunities at national, regional and international levels; carrying out research and studies; advising the Government; and developing good relations and collaborating with other agencies carrying out similar missions.

9. ***Rwanda Capacity Development and Employment Services Board (CESB)*** established under the Law Nº43/2016 of 18/10/2016 is strategically positioned under the Ministry of Public Service and Labour (MIFOTRA). CESB aspires to be a center of reference and support engine for Capacity Development interventions and Employment Promotion advisory services in the Country. Its mission include, among others: (i) advise Government on the implementation of institutional capacity-building and human resource development strategies and how to match them with employment promotion; (ii) monitor and coordinate the implementation of the national institutional capacity-building and human resource development strategies and those related to employment promotion; (iii) play a role in the national institutional capacity-building and human resource development planning; (iv) manage the National Capacity Development Fund and mobilize resources for initiatives under capacity development and employment promotion.

10. ***Partnerships*****.** KIIWP will provide an opportunity to further strengthen the collaboration with the other Rome-based UN agencies. The project will leverage FAO expertise in FFSs which will be used to enhance smallholders' CSA and AH practices and technologies. The use of Rural Invest to develop bankable business plans, and mobile apps developed by FAO (e.g. Agrimarket place, Weather and Crop Calendar, e-Nutrifood, and a Cure and Feed livestock app) will also be promoted in project implementation during KIIWP 2. IFAD experience with FAO and International Water Management Institute (IWMI), in supporting investments in Agricultural Water Management (AWM) has informed the design of KIIWP 1 and will be instrumental to further shape KIIWP 2.

11. Potential areas for collaboration with WFP include the Farmer to Market Alliance (FtMA), which takes a market led approach promoting access to predictable markets and affordable finance, to technologies and quality input, including handling and storage solutions. Partnerships with NGOs and key players, such as AGRA, SNV and Technoserve, will be continued to pilot innovations and mobilise additional resources for the achievements of the project development objectives. Opportunities to collaborate with ICCO International have been particularly explored during the design process. The newly launched 'Strengthening African Rural Smallholders' (STARS) provides concrete opportunities for cooperation. KIIWP will leverage on the existing resources of ICCO-STARS to scale-up its current interventions in Kayonza, which is based on supporting smallholders through a combination of interventions meant to enhance backward and forward linkages: develop entrepreneurship skills, strengthen cooperative governance, promote business models to access inputs and post-harvest

equipment through partnerships with processors, build the capacity of financial institutions, develop agricultural assessment tools for risk mitigation.

Annex 14: Project risks and mitigation measures foreseen in KIIWP2

Main risks	Mitigation measures
Climate and environment risk. Rwanda faces increasing effects of climate change as evidenced by prolonged droughts.	Strengthening resilience to drought and promotion of CSA and AH practices and technologies form a major part of the project.
Land fragmentation and high population density lead to catchment degradation.	Catchment rehabilitation and protection structures and systems will be implemented, new farming systems are required to increase productivity and water efficiency.
Competition between water users in times of scarcity (especially irrigators and cattle owners).	KIIWP provides for increasing water storage (small valley dams) or (solar powered) boreholes for livestock. Catchment water management committees will be strengthened, in order to support joint management of limited water resources.
Low farming entrepreneurship skills prevent the graduation of the target population from subsistence farmers to commercial smallholder farmers.	Farming as Business skills will be enhanced through the proximity coaching approach. Particular emphasis will be put on the basics of FaaB, that are a pre-requisite to enable farmers to take informed decisions on what they should produce, which market they should aim at and which investment they can afford.
Weak management capacity of cooperatives hampers their ability to develop as a fully-fledged commercial entity to market crop surplus.	KIIWP is expected to (i) support focused capacity development programmes to foster the governance and management capacity of cooperatives, and (ii) facilitate their marketing arrangements with traders, processors and/or major off-takers through improved communication and negotiation skills, market-based production programming and joint marketing. BDSPs will actively accompany the cooperatives up to the stage of signing supply contracts that ensure a fair distribution of the profits and enhanced trust between the different parties.
Lack of large and/or reliable market could lead to heavy post-harvest losses, especially for the most perishable products like fruits and vegetables.	The rapid rate of urbanization in Rwanda has already initiated a strong growth in the domestic demand for horticultural produce. The demand for horticulture exports is also on the raise (+ 75% in export value from 2016 to 2017), and cross-border trade is a substantial market that is extremely profitable during the dry season, when the regional production is low. Irrigated lands will thus enjoy a comparative advantage during these months. In all cases, the selection of horticultural produce grown under KIIWP will be 100% market-driven. KIIWP is also expected to capitalize on experience of PRICE and PASP projects: through the BDSPs, the project will engage actively with the key off-takers who have already managed to make a break through on the international markets.
Common External Tariff barriers and unregulated importation of cheaper soya	Thorough market assessment and gross margin analysis will be carried out with the support of the

Main risks	Mitigation measures
beans from external markets could affect the competitiveness of Rwanda farmers and their interest in producing such crops despite high demand from the private sector (esp. for animal feed).	BDSPs before farmers engage in soya production. Should this crop reveal to be less profitable than other crops farmers would like to engage in, it will be replaced by an alternative crop that presents a better comparative advantage.
Limited access to financial services restrains smallholder farmer's capacity to (i) invest in the small-scale irrigation technologies (SSIT) and (ii) access the necessary working capital to implement the CSA practices promoted by KIIWP.	KIIWP will strive to build on the existing agricultural lending products that were developed in the last years. Opportunities to collaborate with ICCO (STARS program) and others will be seized and a grant fund to assist smallholder farmers in accessing finance to co-invest in irrigation technologies and post-harvest infrastructure will be set in place.
Weak technical capacity, governance and institutional capacities can lead to slow disbursement, lower project benefits as well as delays in implementation.	Raising awareness and capacity building are key elements, especially of FOs and District, Sector and Cell level staff. The SPIU is already in place with core staff. Involvement of experienced technical KWAMP staff will also speed up project implementation. Supervision and implementation support missions, especially in years 1 and 2 will support focused project implementation.
The re/afforestation activities foreseen in Kayonza water catchment areas, that are now falling under the Ministry of Environment and Natural Resources, may not intervene along the same timelines as the project 's interventions.	The PSC chaired by the PS MINAGRI will play a key role in ensuring that KIIWP's interventions are well coordinated with those of other Ministries, especially the Ministry of Environment that has launched a special planting programme in the Eastern Province (see Annex 12 SECAP Note). The sector- and district level catchment committees are also expected to further ensure that this programme responds well to the specific needs of KIIWP target groups.

Annex 15: Key milestones for moving to KIIWP 2

KIIWP will be implemented in two phases (KIIWP 1 and 2) that are meant to facilitate an early inception of the project and respond to the urgent demand of the Government of Rwanda to tackle drought-related issues in the Eastern Province within the shortest possible time. KIIWP 1 will implement the necessary preparatory works, ahead of the large irrigation infrastructure activities and farm business development support that will take place during KIIWP 2.

The key triggers for proceeding from the KIIWP 1 to KIIWP 2 will be as follows:

1. Completion of feasibility studies to identify irrigation schemes that are financially, economically, environmentally and socially viable and sustainable. The criteria for viability will be established on a subproject basis, taking into consideration location specific contexts.
2. The recruitment of a team of experts, quality assurance team, to review project implementation outputs. The key outputs of the project related to Category A activities will be reviewed by a quality assurance team. This will include, but not limited, to feasibility studies, ESIAs, RAPs, detailed engineering designs and implementation of construction and ESMPs and RAPs.
3. ESIAs and RAPs are disclosed at local community level, national and IFAD website for a minimum 120days, all comments collected and the reports finalised.
4. Any transboundary water related requirements are implemented.
5. Provision of a budget and commitment, by the Government of Rwanda, to implement the resettlement action plan (RAP) and other ESMP activities as may be identified by the ESIAs.
6. Revision of the PDR and PIM to incorporate the findings of the study. This will include revised cost and financing tables. Approval of the revised design documents by the DRM and decision to proceed to Phase 2.
7. Assessment to verify whether the triggers for proceeding to the next phase are met.

Before submitting KIIWP 2 for EB approval, IFAD Senior Management will assess if conditions have been fully met to proceed to the next Phase.