



Part I: Project Information

GEF ID

10965

Project Type

MSP

Type of Trust Fund

LDCF

CBIT/NGI

CBIT **No**

NGI **No**

Project Title

SMARTFARM - A data and digital technology driven and farm management solution for climate resilience.

Countries

Regional

Agency(ies)

IFAD

Other Executing Partner(s)

Cropin Technology Solutions B.V.

Executing Partner Type

Private Sector

GEF Focal Area

Climate Change

Sector

AFOLU

Taxonomy

Stakeholders, Capacity, Knowledge and Research

Rio Markers

Climate Change Mitigation

No Contribution 0

Climate Change Adaptation

Principal Objective 2

Biodiversity

Land Degradation

Submission Date

1/31/2023

Expected Implementation Start

6/17/2023

Expected Completion Date

6/16/2025

Duration

24In Months

Agency Fee(\$)

77,856.00

A. FOCAL/NON-FOCAL AREA ELEMENTS

Objectives/Programs	Focal Area Outcomes	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
CCA-1	Reduce vulnerability and increase resilience through innovation and technology transfer for climate change adaptation	LDC F	819,536.00	3,755,000.00
Total Project Cost(\$)			819,536.00	3,755,000.00

B. Project description summary

Project Objective

To enable 200,000 smallholder farmers in Ethiopia and Rwanda to improve their crop productivity, food and nutrition security and build resilience to climate shocks through delivery of real-time weather and climate data along with data-driven farm advisory services.

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing (\$)	Confirmed Co-Financing (\$)
Component 1: Deployment, adoption and scale up of SMARTFARM for increasing climate adaptation and resilience of 200,000 SHF units (150,000 in Ethiopia and 50,000 in Rwanda) cumulative in 2 year period including women with help of 2000 village/agri entrepreneurs.	Investment	<p>1.1 Increased number of farmers adopting improved and sustainable agricultural practices</p> <p><u>Indicators and targets:</u></p> <p>(i) Number of direct beneficiaries disaggregated by gender as co-benefit of GEF investment (130,000, 50% women)</p> <p>(ii) Proportion of farmers registered on the SMARTFARM maintaining a crop health scorecard (10% or ~13,000)</p>	<p>1.1.1 Farmers receiving e-extension services</p> <p>1.1.2 Farmers adopt improved soil management practices and post-harvest management</p>	LD CF	600,000.00	2,010,000.00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing (\$)	Confirmed Co-Financing (\$)
Component 2. Capacity building of identified/select ed farmers? and rural organizations and institutions/producer organizations, 2,000 village/agri entrepreneurs, and implementation partners for knowledge and asset transfer	Technical Assistance	<p>2.1 Improved crop & Livestock productivity through reduction in pre-harvest and post-harvest losses</p> <p><u>Indicators and targets:</u></p> <p>Proportion of farmers reporting reduction in pre-harvest and post-harvest losses (100% or ~130,000)</p>	<p>2.1.1: Farmers receive capacity building from lead farmers on improved agronomic practices</p> <p>2.1.2 Farmers receive last mile support from inputs suppliers and other service providers</p>	LD CF	100,000.00	420,000.00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing (\$)	Confirmed Co-Financing (\$)
Component 3. Creation of partnerships, knowledge and tools for promoting intra engagement of off-takers, buyers and institutions for credit and market linkage, and scaling up and replicating the model with member countries.	Technical Assistance	3.1 Improved access to markets for produce Indicators and targets: Proportion of farmer/groups linked to potential buyers on the SMARTFARM platform (50% or ~65,000)	3.1.1 Smallholderfarmers are linked to agribusinesses and market players through the platform	LD CF	69,536.00	1,037,350.00
Sub Total (\$)					769,536.00	3,467,350.00
Project Management Cost (PMC)						
LDCF			50,000.00	287,650.00		
Sub Total(\$)			50,000.00	287,650.00		
Total Project Cost(\$)			819,536.00	3,755,000.00		

Please provide justification

C. Sources of Co-financing for the Project by name and by type

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount(\$)
GEF Agency	IFAD	Loans	Investment mobilized	2,130,636.00
GEF Agency	IFAD	In-kind	Recurrent expenditures	269,364.00
Private Sector	CropIn	Grant	Investment mobilized	1,000,000.00
Private Sector	CropIn	In-kind	Recurrent expenditures	250,000.00
Recipient Country Government	Ministry of Agriculture, Ethiopia	In-kind	Recurrent expenditures	105,000.00
Total Co-Financing(\$)				3,755,000.00

Describe how any "Investment Mobilized" was identified

Investment mobilized was identified in consultation with partners during Project Identification Form (PIF) and CEO Endorsement Request development in 2022. It totals USD 3,755,00 million and includes: 2,400,000 USD in grant financing from IFAD through the Kayonza Irrigation and Integrated Watershed Management Project (KIIWP 2, 2022-2027) in Rwanda and the Participatory Small-scale Irrigation Development Programme II (PASIDP II), 2016-2024 and Participatory Agriculture and Climate Transformation Programme(PACT) 2022-2028 in Ethiopia ; 1,250,000 USD in-grant cofinancing from Crop-In from investments in technology and project management costs.

D. Trust Fund Resources Requested by Agency(ies), Country(ies), Focal Area and the Programming of Funds

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount(\$)	Fee(\$)	Total(\$)
IFAD	LDC F	Regional	Climate Change	NA	819,536	77,856	897,392.00
Total Grant Resources(\$)					819,536.00	77,856.00	897,392.00

E. Non Grant Instrument

NON-GRANT INSTRUMENT at CEO Endorsement

Includes Non grant instruments? **No**

Includes reflow to GEF? **No**

F. Project Preparation Grant (PPG)

PPG Required **true**

PPG Amount (\$)

50,000

PPG Agency Fee (\$)

4,750

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount(\$)	Fee(\$)	Total(\$)
IFAD	LDC F	Regional	Climate Change	NA	50,000	4,750	54,750.00
Total Project Costs(\$)					50,000.00	4,750.00	54,750.00

Meta Information - LDCF

LDCF true

SCCF-B (Window B) on technology transfer false

SCCF-A (Window-A) on climate Change adaptation false

Is this project LDCF SCCF challenge program?

true

This Project involves at least one small island developing State(SIDS). false

This Project involves at least one fragile and conflict affected state. true

This Project will provide direct adaptation benefits to the private sector. false

This Project is explicitly related to the formulation and/or implementation of national adaptation plans (NAPs). true

This Project has an urban focus. false

This Project covers the following sector(s)[the total should be 100%]:*

Agriculture	50.00%
Natural resources management	0.00%
Climate information services	30.00%
Coastal zone management	0.00%
Water resources management	10.00%
Disaster risk management	5.00%
Other infrastructure	0.00%
Health	5.00%
Other (Please specify:)	0.00%
Total	100%

This Project targets the following Climate change Exacerbated/introduced challenges:*

Sea level rise false

Change in mean temperature false

Increased climatic variability true

Natural hazards true

Land degradation true

Coastal and/or Coral reef degradation false

Groundwater quality/quantity false

Core Indicators - LDCF

CORE INDICATOR 1

Total

Male

Female

% for Women

Total number of direct beneficiaries

130,000

65,000

65,000

50.00%

CORE INDICATOR 2

Area of land managed for climate resilience (ha)

0.00

CORE INDICATOR 3

Total no. of policies/plans that will mainstream climate resilience

0

CORE INDICATOR 4

Male

Female

% for Women

Total number of people trained

2,000

1,000

1,000

50.00%

To calculate the core indicators, please refer to [Results Guidance](#)

OBJECTIVE 1

Reduce vulnerability and increase resilience through innovation and technology transfer for climate change adaption

OUTCOME 1.1

Technologies and innovative solutions piloted or deployed to reduce climate-related risks and / or enhance resilience



[View](#)

OUTCOME 1.2

Innovative financial instruments and investment models enabled or introduced to enhance climate resilience



[View](#)

OBJECTIVE 2

Mainstream climate change adaption and resilience for systemic impact

OUTCOME 2.1

Strengthened cross-sectoral mechanisms to mainstream climate adaption and resilience



[View](#)

OUTCOME 2.2

Adaptation considerations mainstreamed into investments



[View](#)

OUTCOME 2.3

Institutional and human capacities strengthened to identify and implement adaptation measures



[View](#)

OBJECTIVE 3

Foster enabling conditions for effective and integrated climate change adaption

OUTCOME 3.1

Climate-resilient planning enabled by stronger climate information decision-support services, and other relevant analysis, as a support to NAP process and/or for enabling activities in response to COP guidance



[View](#)

OUTCOME 3.2

Increased ability of country to access and/or manage climate finance or other relevant, largescale, pragmatic investment, as a support to NAP process and/or for enabling activities in response to COP guidance



[View](#)

OUTCOME 3.3

Institutional and human capacities strengthened to identify and implement adaptation measures as a support to NAP process and/or for enabling activities in response to COP guidance



[View](#)

Part II. Project Justification

1a. Project Description

The Global environmental and/or adaptation problems, root causes, and barriers that need to be addressed (systems description):

1. ***The increasing volatility of weather patterns caused by climate change is posing significant challenges for smallholder farmers around the world.*** Agriculture is an income source for an estimated two-thirds of adults living in poverty^[1], who typically lack the resources to maximize yields and respond effectively to production challenges, such as adverse weather conditions, crop pests and disease. The smallholder farmers face increasing volatile climate:
 - a) Developing countries are experiencing 20 percent more extreme heat now than in the late 1990s.
 - b) Areas exposed to serious drought and flooding are expected to increase by up to 44 percent by 2050.
 - c) Higher temperatures reduce the amount of water available for crops by drying out air and soils, put stress on livestock, reduce labor productivity and increase pests and diseases for both livestock and crops.
 2. ***The food and agricultural production of smallholder farmers*** is highly exposed to a wide range of climate changes and unpredictable local weather variations due to rising temperatures, heatwaves, unpredictable rains and depleting water which are intensifying the already formidable production and climate related risks. ***This results in increased food insecurity and livelihoods at risks:***
 - a) The number of people affected by hunger has been rising since 2014. In 2019, nearly one in ten people in the world were exposed to severe levels of food insecurity, in part due to climate shocks. Researchers estimate that climate change will depress growth in global yields by five to 30 percent by 2050^[2].
 - b) In some African countries, yields from rainfed agriculture may have declined by as much as 50 percent by 2020, with smallholder farmers hit hardest.
 - c) Climate change is likely to raise food prices by 20 percent¹² for billions of low-income people^[3].
 3. ***Smallholder production is vulnerable due to fragmented and small-size of lands, poor incomes, and limited or no access to climate resilient inputs and climate smart agriculture practice:***
 - a) Globally, 500 million farms are two hectares or less^[4].
 - b) Two-thirds of adults living in poverty generate at least some of their income through agriculture.
 - c) Smallholder agriculture is typically rainfed, including 90 percent in sub-Saharan Africa^[5].
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- d) Access to agricultural insurance or other formal safety nets is limited. In Sub-Saharan Africa, it is estimated that less than three percent of smallholder farmers are insured. In Asia, 22 percent have insurance[6]6.
- e) Inputs such as improved seed and fertilizer are not widely accessible, keeping adoption low. For example, the adoption rate of improved maize across Africa is approximately 28 percent[7]7.
4. The variable production, absence of credible evidence on harvest and quality of the agri-produce, fragmented smallholder agriculture markets systems, have resulted in increased risks for off-takers and buyers (markets) to participate with SHFs. In particular, yields have been variable due to erratic climate events (e.g. flooding, droughts) occurring and smallholder farmers not having sufficient resilience for coping with the consequences.
5. Crop pests, diseases and weeds are identified as the greatest risk which are linked to climate and weather. Losses due to pests and diseases are estimated at: 10-20% (preharvest); 20-30% (postharvest); and up to 100% for perishable crops and export crops. Examples of key pests are coffee wilt disease, cassava brown streak virus, and fruit flies.
6. Lack of (a) information on digital climate, agricultural and financial services; (b) assets; and (c) capacity of smallholder farmers and institutions further accentuate the risks and challenges faced by smallholder farmers due to climate change. Publicly available data from weather stations is sparse in most developing countries for instance with 4 stations operational in Rwanda and 7 stations in Ethiopia. These sparsely distributed weather stations do not sufficiently present information regarding local weather conditions. Moreover, the information is not easily accessible for smallholder farmers.
7. Financial services that would support these investments, such as agricultural credit, and formal safety nets like agricultural insurance, are also not available to most smallholders. It is estimated that areas exposed to extreme weather will increase by up to 44 per cent by 2050, with affected areas experiencing reduced soil fertility and increased pest and disease pressures. As a result, there is a risk that growth in global yields could decline by as much as 30 per cent by 2050, driving up food prices and exposing millions more to food insecurity and hunger.
8. In Ethiopia and Rwanda, declining soil fertility is a major contributor to low crop productivity. Traditional farming systems deplete nutrient balances in soils resulting in low yields and contribute to food insecurity. The soil deficiencies in important micro nutrients also limit the production potential in both irrigated and rain fed areas. There is need to introduce crop intensification programs based on efficient use of organic resources and fertilizers to enhance food security and to guard soil and environmental degradation. Further, most farmers in both countries primarily depend on rain-fed agriculture and current practices in rain-fed agriculture contribute to major landscape degradation, and are themselves barely viable, producing only sufficient basic food for households in good seasons and deficits in poor years. In addition, it also noted that smallholder farmers do not receive up to-date information and knowledge in a timely manner and that there is inadequate physical support to
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smallholder farmers by extension service providers. It is against this background that IFAD designed PASIDP and KIIWP project interventions in Ethiopia and Rwanda.

9. For example, in Ethiopia, the PASIDP II and PACT Projects were designed based on the assumption that by providing smallholder farmers with access to water through a secure irrigation production base as well as access to extension services and markets, would contribute to improved crop production and higher volumes of produce sold thereby addressing food insecurity and nutrition and by extension contribute to poverty reduction. In Rwanda, the main goal of KIIWP I & II is the reduction of poverty and increase in food security for rural households and this is to be achieved by enhancing the resilience of SHF against extreme climatic events such as severe drought through rehabilitation and protection of degraded lands, promotion of land husbandry activities, irrigation development and promotion of Climate Smart Agriculture (CSA).

The baseline scenario and any associated baseline projects;

10. ***Business-as-usual (BAU).*** The BAU baseline assumes that future development trends will follow those of the past. The proposed project will explore synergies with new and on-going IFAD-supported projects as well as those supported by other agencies such as with ATA Africa and AGRA.

Kayonza Irrigation and Integrated Watershed Management Project ? Phase 1 and 2 (KIWP)

11. The main goal of the KIWP project in Rwanda is the reduction of poverty and increased food security for rural households. Smallholder farmers will become more resilient against extreme climatic events such as severe droughts. Phase 1 (KIWP1) is an ongoing project starting in 2019 and completing in 2022. Phase 2 (KIWP2) was approved in 2021 and is expected to be completed in 2027. The first phase focuses on addressing urgent issues regarding drought and conducting feasibility studies for irrigation schemes in support of the planned activities in the second phase.

12. The overall outcomes of the project are: (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

13. The SMART FARM project will align with outcomes (iii-vi) focus on introducing climate smart agricultural practices through farmer field schools (FFS). Major crop types are paddy, maize, potatoes, soya and horticultural crops. The SMARTFARM will align with the ~550 FFS that are planned under the KIWP project.

a) There is scope to introduce localized climate information services to farmers for climate resilience through the FFS and build capacity of local institutions and service providers to use digital technologies to further scale this.

Participatory Small-scale Irrigation Development Programme II (PASIDP II)

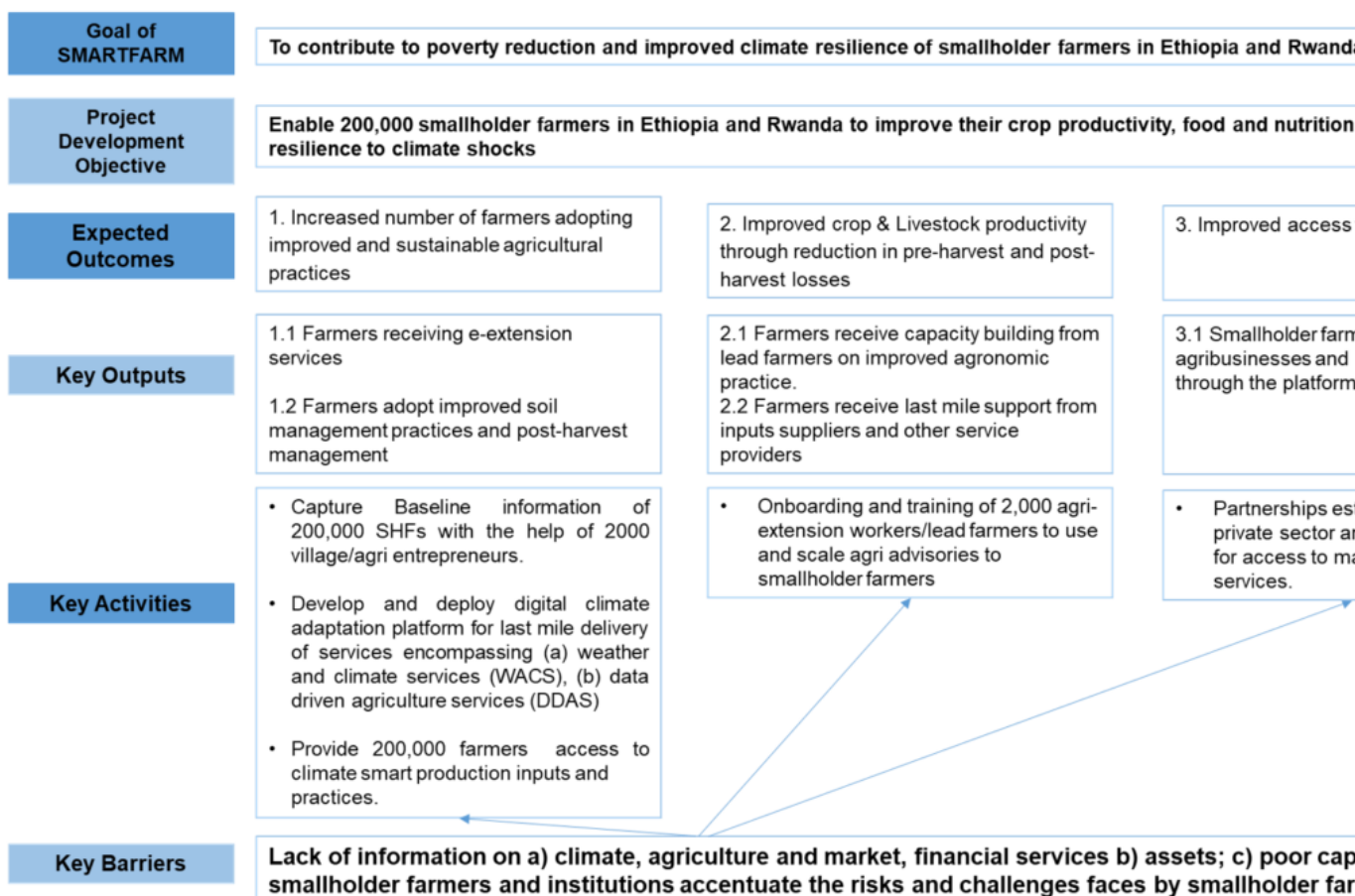
14. The PASIDP is the second phase of an earlier project implemented in Ethiopia from 2008-15. The phase 2 project is operational from 2016 and due for completion in 2024. Small-scale irrigation projects are initiated in four regions: Amhara, Oromia, Tigray, and the Southern Nations, Nationalities and People's Region. The goal of this project is to further enhance the productivity of farmers through the small-scale irrigation projects and climate smart agricultural practices; ultimately improving the food security and livelihoods of the farmers. PASIDP II is based on the assumption that poor farmers who are provided with access to a secure irrigation production base as well as access to markets and services, will be able to produce and market greater volumes of produce in a profitable scenario.

15. The watersheds contiguous with the irrigation schemes, which exhibit varying levels of degradation, will also receive investment to stabilize and improve their productive capacity and enhance the resilience of systems. This will improve the prosperity, food security and nutrition of farmers, thereby improving their resilience against external shocks, including those induced by adverse weather and climate change. In order to achieve these goals, the interventions enable increased profitable production and productivity of the targeted farmers in food insecure Woredas. The SMART FARM project in alignment with the activities proposed under the project will support technology adoption for improved climate adaptation for smallholder farmers through local climate information services, integrated marketing, and financial services which also support the overall development objectives of the project

3) The proposed alternative scenario with a brief description of expected outcomes and components of the project; and the project's Theory of Change

16. In the alternate scenario, SMARTFARM will be integrated to the ongoing projects in Rwanda and Ethiopia. As a start, baseline information relation to crops, geo-coordinated and farmer information will be gathered on the platform through lead farmers. Weather, Agriculture and Climate Advisory services will be rolled out to the registered farmers based on in-situ (farm, farmer, derived farm data), earth observation/Satellite (EO) and weather data to strengthen smallholder farming systems & institutional climate adaptation and resilience by increasing farm productivity through data-driven farm management, crop life cycle, irrigated water management, better access to inputs and agronomical knowledge, and improved access to markets and finance. Overall, below theory of change describes the overall goal, objective, outcomes, outputs and the key barriers that are being addressed through this project.

Figure: Theory of Change



17. *Weather and climate services, data-driven agriculture and agri-digital financial services have the greatest potential to positively impact smallholder climate resilience.* Digital technologies enable a range of services that can mitigate the challenges smallholder farmers face, and help agricultural value chains function better, especially in the last mile. In the present project, digital agricultural solutions are grouped into three broad categories of access. The digital agriculture services allow smallholder farmers to directly mitigate the impacts of long-term climate change, short-term climate shocks and extreme weather events.

18. *Weather and climate services (WACS)* are advisory services that provide valuable and actionable information to smallholder farmers on the hyper local changing weather conditions. The three sub-use cases of weather nowcasting, weather forecasts and climate prediction represent services that extend further into the future, and therefore require different data sources and modeling approaches. CropIn deploys SMARTFARM application to offer hyper local weather forecasts. CropIn will set up weather based rule engines in the Climate Sense module which gets activated if the weather conditions match for the plot. This will trigger a SMS to the farmers. CropIn has global partnerships with the likes of IBM that have weather stations for every 500 m x 500 m grid which is nearly for every 60 acres we get weather data specific to that location. Besides, synergies with local meteorological organizations will be explored in the programme.

19. **Data-driven agriculture services (DDAS)** use localized and timely data to create information and advisory services for agricultural value chain actors collected through SMARTFARM platform. Agricultural intelligence services monitor and predict agricultural activities to support decision making for a variety of organizations. Climate-smart agri advisory builds on traditional agricultural advisory services by incorporating local and timely data to tailor advisory messages to farmers' current farm conditions. Precision agriculture uses hyperlocal data sources, such as sensors and UAV imagery, to optimize on-farm activities, and may involve elements of mechanization, such as solar irrigation.

20. **Agri digital financial services (Agri DFS)** include agricultural credit and agricultural insurance that can help smallholder farmers become more resilient to climate change. Agricultural credit includes digitally enabled credit products that smallholders can use to access agricultural assets, inputs and services. Index insurance refers to insurance that relies on the modeling and monitoring of observable phenomena (such as rainfall) to determine insurance costs and pay-outs. CropIn deploys SMARTRISKS and PLOTTRISKS to score farmers and farms out of 100 to gauge the risks associated with the particular farmer.

21. **Digital Agri-Market services (DAMS)** include complete farm to fork traceability and horizon on harvest and yield for off-takers and buyers to participate in business relationships with smallholder farmers institutions through traceability, digital procurement, and e-commerce platform. CropIn deploys ROOTTRACE and MARKETPLACE applications under this component.

Digital agriculture plays an important role in climate resilience, from long-term adaptation to short-term responses

22. **Adaptation** to climate change can take place when farmers are aware of the longer-term shifts in climate affecting them and have the resources to adopt practices that will maximize their productivity in this new context. Climate prediction and climate-smart agri-advisory provide the information farmers need to understand climate change and the implications for local agriculture. In the medium term, seasonal weather forecasts allow farmers to select appropriate climate adapted crops and varieties, and plan their agricultural activities.

23. Throughout the cropping season, weather forecasts, nowcasts and early warnings provide advance warning of adverse events, allowing farmers to **respond** to changing meteorological conditions where possible. In the case of adverse weather events, such as droughts or heavy rainfall, insurance provides a safety net for farmers to recover some of their production costs or lost income. Similarly, agricultural credit can be a catalyst for **recovery**, allowing farmers to invest in agricultural inputs for the next season after suffering losses in the past.

24. Agriculture contributes to climate change by producing greenhouse gas (GHG) emissions, primarily through livestock production and deforestation. Agri-intelligence services can monitor land use changes, alert relevant authorities to deforestation activities and allow agribusinesses to identify risk in their supply chains. Together, these services can reduce the net carbon emissions of agriculture and contribute to climate change **mitigation**. Meanwhile, agricultural credit can enable smallholder farmers to shift to more sustainable farming practices through increased access to inputs and assets, and therefore reduce the need to expand their cultivated land.

25. ***SMARTFARM will leverage digital technologies*** such as Artificial Intelligence, Machine Learning, Remote Sensing & mobile telecommunication to offer data driven agriculture digital services (WACS, DDAS, Agri-DFS, & DAMS) on innovative and collaborative digital platforms, i.e., cloud web-based & mobile application, based on three-pronged data approach '3PDA': in-situ (farm, farmer, derived farm data), earth observation/Satellite (EO) and weather data to strengthen smallholder farming systems & institutional climate adaptation and resilience by increasing farm productivity through data-driven farm management, crop life cycle, irrigated water management, better access to inputs and agronomical knowledge, and improved access to markets and finance.

26. ***A four-step process for designing digital site-specific/farm-site-specific (local context) and region specific (regional and national level) digital services for smallholder farmers? climate change adaptation*** and become resilient and proactive to mitigate both long-term climate and local weather shifts and short term shocks, weather-related disasters, and pests and diseases etc. The four-step process is as follows:

Data collection and acquisition: acquiring baseline farm-site historical, current and forecast data through digital tools and technologies through a three-pronged data approach (3PDA), i.e., in-situ, remote sensing/earth observation (EO)/satellite, and weather and climate data. This also includes building synergies between the local meteorological organizations that are providing these services.

Data analysis and issue information maps: detection, identification and characterization of site-specific issues through data analysis, i.e., agronomy issues (crop-planning, crop-physiology, health and nutrient, crop stress, water stress, harvest, weeds, pest and disease etc.), input issues, credit issues, and market.

Production of digital services: The issue analysis and information maps are converted into a design process for site-specific digital services, namely, WACS, DDAS, Agri-DFS, DAMS.

Delivery of services: this includes strategy on farm & farmers level adoption of digital services, delivery mode, Implementation, feedback, iteration and re-design, and final delivery. For the design of region-specific solution, the site-specific solution is extrapolated into region specific solution based on regional level data, where Govts, policy makers, and donor decisions informed by macro-agricultural intelligence that draw on big data and machine learning to identify vulnerable areas and model the counter moves and outcomes of interventions.

27. The rationale for adoption of SMARTFARM as a digital solution to support agriculture in Ethiopia and Rwanda is that use of technology will contribute to provision of timely, contextualized and site specific advisory services to farmers such as on best soil and water management, crop production practices and climate data. SMARTFARM will promote the use of real-time weather and climate data along with data-driven farm advisory available to smallholder farmers, hence increasing adoption of climate resilient agriculture practices and enhancing rural communities' resilience to climate change. As a consequence of adoption of digital technology, it will be possible to have farm location data in order to provide context specific responses that will be based on prediction data using advance analytical techniques to generate advisories.

28. It is envisaged that at the end of a crop season and upon achieving a significant scale in farmer registration and farm digitization, each farm will generate its own scorecard periodically. This scorecard will enable assessment of performance and prescribe the next steps based on a crop health score and based on learnings from other connected farms in the platform. As the adoption scales and critical mass is achieved on platform the project will scale to connect farmers to third parties like financial services, insurance providers, input and output companies, advisory companies, and potential buyers.

29. This grant from the Global Environment Facility (GEF) to implement SMARTFARM Technology in Ethiopia and Rwanda, with IFAD as the Implementing Agency will support rollout of SMARTFARM
30. CropIn through its innovative and collaborative digital platform, SMARTFARM, will combine: digital technologies and services; big data analysis, and climate data on a regional and hyper local weather level; and focused human efforts of targetted 2,000 agri-entrepreneurs built on digital technology training, actionable insights and advisories to increase climate adaptation and resilience of 200,000

smallholder farmers across several agri-value chains in Ethiopia[8]8 and Rwanda[9]9 over a period of a two years. The climate adaptation and resilience model will serve as farm and farm management solution that is a sustainable, replicable and scalable for smallholder farmers and will include the following : (i) End to end digitalizing and streamlining of farm process and modules for smallholder farmers; (ii) early decision making support system comprising of crop advisories, pest and disease alerts and plot level stress analysis based on in-situ and climate projection data and hyper local weather from sources such as the IBM weather data, World Bank Climate Change Knowledge Portal and other institutional repositories like the World Meteorological Organization; (iii) Building institutional capacity of identified lead farmers? organizations/producer organizations and governments for long term asset creation and sustainability and (iv) Risk mitigation for all actors in the agri-value chain and increasing stability in prices based on trust and confidence build on data and evidence.

4) SMARTFARM will have the following three components.

Target groups - Implementation of the SMARTFARM Solution in Ethiopia will target from among a total of 83,750 households (HHs) under PASIDP II comprising of 46,250 HHs in the irrigated areas and 37,500 in the non-irrigated areas as per the project design document together with a total of 66,250 HHs under the PACT Programme over a two-year period. Implementation of the SMARTFARM Solution in Rwanda will target from a total of 50,000 households (HHs) under KIIWP II as per the project design document.

Over the two-year period it is planned to touch 200,000 household units of which in Ethiopia 50,000 unique households would be added in year 1 and served for the second year as well with an additional 50,000 new households added in year 2 totaling to 150,000 households served cumulative in two-year period. Similarly, in Rwanda 20,000 farmers would be added in year 1 and served for two years with additional 10,000 farmers added in year 2 totaling to 50,000 household units served in two -year period. This will help have a good balance of farmers served for one and two years respectively compared to selecting unique 200,000 households and serving them for a year.

As per the design of PASIDP and PACT and in alignment with KIIWP I &II design, SMARTFARM target beneficiaries will include women (50%), youth (40%) and Persons Living with Disability-PWD (5%). The primary target group will also include: a) Poor households (with land holding less than 2ha of cultivable land with limited livestock); b) pastoralists; c) agro-pastoralists engaged in less diversified traditional livelihood systems; d) PWD in rural areas; e) rural underemployed and unemployed youths owning no or small land; and f) female headed households

The Programme will ensure mainstreaming disability inclusion in all the Programme components, subcomponents and activities and targeting PWDs themselves to enable access to digital services. This will be done through a) Targeting farmers with disability to enable participation in Programme activities such as training ; b) review of the training content by the disability inclusion expert, c) work with the project PMUs to under PASIDPII and KWIIP to create a disability inclusive environment and disability inclusive activities across all project components.

Digital extension and dissemination of climate information: the Programme will equip DAs with ICT capacity for data collection as well as ensuring that Village Based Advisors promote disability inclusion and participation of youth to ensure equal access to information.

Component 1: Deployment, adoption and scale up of SMARTFARM for increasing climate adaptation and resilience of 200,000 SHF units (150,000 in Ethiopia and 50,000 in Rwanda) cumulative in 2 year period including women with help of 2000 village/agri entrepreneurs.

Under component 1, SMARTFARM will digitalize 130,000 smallholder households - registering farmer & farm to climate program, capturing historical trends, advising crop selection, monitoring sample farms remotely through satellite and weather forecasts, curate technical know-how and advisories on planning and management, inputs and credits, sowing and harvest window, irrigation plans, early pest and disease forecast, crop stress, fertigation and pesticide spray, and ensuring efficient usage of available resources.

Component 1 will also include decision making support system in form of advisories based on in-situ and climate projection data of regional and hyper local weather from sources such the IBM weather data, World Bank Climate Change Knowledge Portal and other institutional repositories like the World Meteorological Organization. An average sampling of selected plots/pin code level on the PLOT RISKS to detect crop health and stress due to factors associated with climate change and forecast yield. SMARTFARM will accelerate Climate Smart Agriculture (CSA) efforts to further influence regenerative practices that lead to better yields and improved soil health and biodiversity, decreased deforestation and increased productivity by improving resource use, supporting early decision making and maintaining 24/7 monitoring systems. SMARTFARM, thereby, builds SHFs resilience to climate change and enables farm related businesses to respond more organically to environmental challenges and adjust systems accordingly.

Upon achieving a significant scale in farm digitization, each farm will generate its own scorecard periodically, to assess performance and prescribe the next steps based on a crop health score and learnings from other connected farms in the network to partner with third parties like banks, insurance providers, input and output companies, advisory companies, and potential buyers in order to access the benefits of their programme and services, and grow into more cost-efficient farm businesses.

Component 2 - Capacity building of identified/selected farmers? and rural organizations and institutions/producer organizations, 2,000 village/agri entrepreneurs, and implementation partners for knowledge and asset transfer.

Under component 2, the project will Identify and select farmers?, rural organizations and institutions/producer organizations for capacity building and transfer of knowledge and assets. The project will also conduct training of 2,000 extension officers mobilized from its institutional partners to capture the relevant data and information and implement package of practice for the 200,000 Smallholder Farmers (SHFs). The digitalization of farmers? institutions and/or producer organizations, and extension workers' activity will enhance their linkages with other service providers to increase their capacity for the last-mile delivery of agricultural advisories, farm planning and management, inputs and services resulting in strengthening productivity and resilience.

Component 3 - Creation of partnerships, knowledge and tools for promoting intra engagement of off-takers, buyers and institutions for credit and market linkage, and scaling up and replicating the model with member countries.

Under component 3, the project will create systematic and integrated knowledge management and tools to build partnerships and promote intra-engagement of value chain actors to inform self-learning design, replication and sustainability, and participation of member governments and private sector for credit and market linkage in the value chains.

31. Lessons Learned from other interventions

Some key lessons learned from past and ongoing IFAD interventions include:

- a) Adequate beneficiary participation approach and community ownership, including adequate engagement in both process and product, greatly enhances long-term sustainability of development

initiatives. SMARTFARM will mobilise and train lead farmers, the extension agents, and leverage on Youth as community change agents during implementation of the technology.

b) The pathway to greater climate resilience of small farm enterprises in through enhanced productivity which in turn requires investment in climate smart technology. While access to water resources through irrigation is crucial, such investments should be backed by complementary investments to enable efficient use of water as a resource to mitigate climate impacts and enhancing knowledge and information to farmers through access to adequate extension services. SMARTFARM will seek to provide timely, contextualized and site specific advisory services to farmers that will be critical to enhancing crop productivity.

c) CropIn climate smart programs have been implemented with partners such as the World Bank, International Finance Corporation (IFC) in Asia and Africa and it has been demonstrated that adoption of these technologies led to 32% increase in crop yield and 18% reduction in pre-season and post-harvest losses. Besides, in Ethiopia, CropIn implemented a pilot digital farm management solution in partnership with ATA and MercyCorps AgriFin in 2020. This digital solution was piloted within ATAs Farmer Production Clusters (FPCs) that enabled delivery of farm advisories to individual smallholder farmers in 26 woredas. This service however, was not scaled up due to funding shortfalls and maintaining the license was very expensive. A key lesson from the pilot was that delivery of digital solutions needs to achieve sufficient scale to make the service sustainable. In addition, on-boarding of private sector value chain actors such as buyers, off-takers, inputs suppliers and financial institutions allows the service to operate on an affordable subscription model for all stakeholders on the platform.

5) incremental/additional cost reasoning and expected contributions from the baseline, the GEFTF, LDCF, SCCF, and co-financing;

Without project intervention	With project
Limited access to information and services available to smallholder farmers on climate, agronomioc practices etc.	Access enabled for registered farmers to localized agronomic advisory based on based on in-situ (farm, farmer, derived farm data), earth observation/Satellite (EO) and weather data to strengthen smallholder farming systems & institutional climate adaptation and resilience by increasing farm productivity through data-driven farm management, crop life cycle, irrigated water management, better access to inputs and agronomical knowledge, and improved access to markets and finance
Limited avilaibility of data on farmers and crops	Aggregated information of 130,0000 farmers including farmer data and crop production made available to enable better and cheapers services and inputs for smallholder farmers
High pre and post harvest losses and vulnerability to climate change related shocks	Access to both SMS/TVRS based agronomic advisory services coupled with localized inputs and services enabled by 2000 lead farmer (including extension staff, project staff)
Limited capacities among extension staff and lead farmers on provision of agriextension and digital services for smallholder farmers	Dedicated capacity building for 2000 lead farmers, project staff and extension officers on data collection, analysis and delivery of services including agronomic and weather advisory services to smallholder farmer

Farmer groups mobilized and being strengthened through ongoing projects	Dedicated support to enable farmers and farmer groups linked to agribusinesses and market thereby improving profitability and viability of the farmer groups beyond project
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Adaptation benefits (LDCF/SCCF);

32. Climate adaptation is an important aspect for coping with future climate projections and extremes. With the innovative SMARTFARM technology, smallholder farmers are equipped with valuable tools and information to adopt climate smart agricultural practices. Globally, smallholder farmers play an essential part in the agricultural sector, providing food for their livelihoods, local community, regionally and nationally. Improving the production and resilience of smallholder agriculture will have a global impact on food security. Food security will be improved and the impact from natural hazards (pests, weather extremes) reduced due to innovative technology and information provision from SMARTFARM.

33. Climate-smart agriculture (CSA) is an integrated approach to managing landscapes?cropland, livestock, forests and fisheries?that addresses the interlinked challenges of food security and accelerating climate change. CSA aims to simultaneously achieve three outcomes:

(a) **Increased productivity:** Produce more and better food to improve nutrition security and boost incomes, especially of 75 percent of the world's poor who live in rural areas and mainly rely on agriculture for their livelihoods.

(b) **Enhanced resilience:** Reduce vulnerability to drought, pests, diseases and other climate-related risks and shocks; and improve capacity to adapt and grow in the face of longer-term stresses like shortened seasons and erratic weather patterns.

(c) **Reduced emissions:** Pursue lower emissions for each calorie or kilo of food produced, avoid deforestation from agriculture and identify ways to absorb carbon out of the atmosphere.

34. Smart farming focuses on managing farms, plantations, and all associated farming activities using IoT, drones, robotics, machinery, and artificial intelligence, to determine a path to predictable farm output. Some major technologies that are most commonly being utilized by farms include: harvest automation, autonomous tractors, seeding and weeding, and drones. Farm automation technology addresses major issues like a rising global population, farm labor shortages, and changing consumer preferences. What makes a technology 'smart' is its ability to communicate and work with other networked technologies, and through this ability to allow automated or adaptive functionality as well as remote accessibility or operation from anywhere.

The SMARTFARM application is estimated to support 200,000 smallholder farmers (SHFs) in priority agri-value chains in Rwanda and Ethiopia for 2 years. The project will provide digital services to farmers of the pilot programme by making real-time weather and climate data along with data-driven farm advisory available to smallholder farmers, hence increasing adoption of climate resilient

agriculture practices and enhancing rural communities' resilience to climate change. This will help smallholder farmers to proactively mitigate both long-term climate and local weather shifts and short-term shocks, weather-related disasters, and pests and diseases.

The digitalization of farmers' institutions and/or producer organizations, and extension workers' activity will enhance their linkages with other service providers to increase their capacity for the last-mile delivery of agricultural advisories, farm planning and management, inputs and services resulting in strengthening productivity and resilience.

The project will, in the long term positively impact food security and nutrition status for smallholder farmers and their families.

The proposed project is fully aligned with the goal of the LDCF/SCCF Programming Strategy 2018-2022 and the objectives of the Adaptation Innovation Challenge Program, through its efforts to promote innovation and entrepreneurship to enhance adaptation and resilience in priority sectors. In response to the enhanced emphasis on private sector engagement in the LDCF strategy, the project is promoting an approach to integrate climate resilience in advisory strengthening the capacities of project developers in LDCs on adaptation mainstreaming. The aligns with LDCF Objective 1: Reduce vulnerability and increase resilience through innovation and technology transfer for climate change adaptation.

7) innovativeness, sustainability and potential for scaling up. ?

35. The following are positive impacts of the SMARTFARM Project:

Ensure Economic Sustainability- The implementation of SMARTFARM technology and engagement of the private sector actors is expected to create visibility of the agri-value chains which will potentially lead to risk mitigation and strengthening of agri-value chains that could contribute to increased investments by agro-processing companies, input suppliers, financial institutions, telecom companies, and development agencies working with the large networks of smallholder farmers under the platform. With these arrangements it would be possible to ensure economic sustainability of the platform through adoption of a user subscription model supported by the value-added services provided by the technology.

36. SMARTFARM intends to support 200,000 smallholder farmers by increasing their potential economic capacity through maximizing farm productivity and quality with a suite of weather and crop and farm advisory services. The full value will be realized gradually once farmers start adopting these data driven practices and decision making over a period of time. It is anticipated that as farm data would build up and benefits start getting released, there would be an uptake from the farmers to invest more and reap higher benefits through better seeds, crop management practices, chemicals etc. These will therefore

support such needs by bringing financial institutions as well as off-takers of the selected commodity value chains on the shared digital platform so that the collective risk can be reduced for the stakeholders. Technology will play a key enabler in terms of data interoperability, building economic and financial profiles based on historical, present and future agriculture performance.

37. In Ethiopia, the sustainability model will entail working with farmers organized around producers? co-operatives, with the co-operatives working under co-operative unions. In each woreda, SMARTFARM will work with two or three co-operatives? organizations under PASIDP II and PACT. These organizations will then be linked to buyers and off-takers with support from the Federal Cooperative Agency (FDA), input suppliers and financial institutions. In Rwanda, the sustainability model will consist of working with farmers under the Farmer Field School (FFS) groups which will then be linked to the 50 co-operatives that had already signed an MoU with the KIIWP I & II Projects in Kayonza District. Through this arrangement the FFS groups and co-operatives will be supported with linkages with buyers, off-takers and financial institutions with assistance from the Rwanda Cooperative Agency (RCA).

38. Under SMARTFARM, farmer representatives from Farmer Clusters, FFS groups will be empowered to leverage digital platforms to digitize farm records and work as an institution to later benefit from collective trade. This would not only help maximize value and generate local employment but also reduce risk and build strong institutional capacity for stakeholders to further engage. It is anticipated that as a result of these benefits, the digital platform would generate social interest of smallholder farmers and other actors in both Ethiopia and Rwanda such as Government agencies and funding agencies such as USAID, BMZ and IDH amongst others and these initiatives would create social sustainability.

39. The SMARTFARM Project will also help farmers in Ethiopia and Rwanda to better understand the important factors such as water, topography, aspect, vegetation and soil types. This allows farmers to determine the best uses of scarce resources within their production environment and manage these in an environmentally and economically sustainable manner. Smart farming reduces the ecological footprint of farming. Minimized or site-specific application of inputs, such as fertilizers and pesticides, in precision agriculture systems will mitigate leaching problems as well as the emission of greenhouse gases.

40. Smart farming can also increase the amount of carbon sequestered in our soils by adopting the right management practices. Reducing tillage, planting cover crops and using organic matter amendments such as compost have been shown to increase the amount of carbon stored in the soil.

41. Overall, the SMARTFARM Project aims at increasing the adaptive capacity and reducing the sensitivity to climate hazards for smallholder farmers in Ethiopia and Rwanda by providing relevant climate based advisory services on effective usage of agriculture inputs and agricultural resources.

Innovation ?

42. SMARTFARM technology is considered innovative, since this will be a one-point field intervention system for recording the farm location and area coordinates where all advisories are triggered via satellite-based crop assessments and local weather parameters. SMARTFARM models predict the crop, the stress and the potential infestation mal alerts that are ready to be deployed for the crops listed across the target areas in the two countries at scale for 200,000 farmers at one go. The cost per farmer is as low as US\$35/farmer/year engagement for the full range of digital services ? Weather and Climate Services (WACS), Data-Driven Agriculture Advisory Services (DDAS), Agri-Digital Financial Services (Agri-DFS), Digital Agriculture Market Services (DAMS) - from farm level intervention to increase productivity to increase in access to finance and incomes. In addition, the project deploys SMARTFARM as a collaborative platform that combines cutting edge technology (Big Data, AI, machine learning, smartphones/tablets, etc.), innovative business model (agriculture platform as a service), and focused human efforts (training, agriculture insights, products, and services) for providing digital services (WACS, DDAS, Agri-DFS, DMAS) to build climate adaptation and resilience of farmers and risk mitigation for all actors in value chains and.

43. Another novel feature of the project is the incorporation of climate projection data at the regional and hyper local weather from sources such the IBM weather data, World Bank Climate Change Knowledge Portal and other institutional repositories like the World Meteorological Organization into the digital model. The project is also innovative in that it will support the development SMARTFARM model led by the lead farmers? and rural institution/producer organisation is easily replicable at policy and institutional levels and for private sector engagement as the platform is sustainable data-driven, scalable, intelligent, self-learning, real-time collaborative digital agri-food system, which serves as a farm as well as farmer management solution, predictive analytics and monitoring tool, and decision support system for all actors in the value chain.

44. The project is innovative in its alignment with other IFAD-funded programmes and other new designs will provide a model of integrated and innovative investments towards digitization of agriculture for greater benefits for smallholder farmers especially the youth and women. The project activities will also aim at sustainable adoption of digital technologies by the IFAD programmes from piloting solutions and business models to evaluate their effectiveness before scaling-up. The SMARTFARM programme will give priority to piloting innovative solutions on farm productivity and create sustainable market and financial linkages for the smallholder producers. Once these digital innovations have been proven effective in specific project areas, it can be replicated in other areas.

45. The project will promote the necessary innovations related to farm level adoption of climate resilience productivity enhancing technologies, combined with improved availability of inputs and services and stronger farmer organizations for producing consistent volume and for sustainable engagement with profitable markets; ICT-based M&E and KM innovations and business based case studies for KM. Learning and knowledge management will be important in drawing lessons from the project to assist the Government with refining its policy and for scaling up the successful elements in their national policies and programmes.

46. Finally, the project is innovative as it will yield positive climate-related, environmental and social impact by (i) reducing the vulnerability of smallholder farmer and institutions to disruptions and losses

from climate impacts, (ii) creating new opportunities for climate resilient and adaptive development and employment, and (iii) demonstrating that investments in resilience and adaptation can deliver social, environmental, and financial returns thereby catalyzing a broader market for resilience products and services.

47. **Potential for scaling up** ? SMARTFARM Project intends to build a sustainable, replicable, and scalable digital climate adaptation model, that serves as a farm and farm management solution and evidence based decision-making support system for smallholder farmers towards climate change. Access to WACS, DDAS, Agri-DAFS and DAMS will support farmers to raise their productivity and resilience to climate thereby improving incomes and enabling better access to inputs and other services. The project will enable financing and linkages with private sector off takers, market players and financial services providers through their active participation enabled by trust and confidence building based on data and evidence. Through strengthening institutional capacity of identified lead farmers' organization/producer company and/or rural institutions, and governments for income & livelihood generation, agri-worthiness, increase in productivity, food & nutrition security and long-term asset creation and sustainability.

IFAD and CropIn will apply extensive experience of implementing similar projects in Asia and Africa and these experiences will be integrated during planning and startup of the project. CropIn climate smart programs have been implemented with partners like the World Bank which demonstrated a 32% increase in crop yield and 18% reduction in losses. These benefits have a high chance of ensuring scalability of the technology.

48. Visibility of the agri-value chains will lead to risk and cost sharing and long-term mitigation. The strengthening of agri-value chains through data and evidence will lead to increased investments from agro-processing companies, input suppliers, financial institutions, telecom companies, and development agencies working with large networks of SHFs that will sustain the cost once the donor institutions exit. Particularly, the project intends to support 200,000 smallholder farmers by increasing their potential economic capacity through maximizing farm productivity and quality with a suite of weather and crop and farm advisory services. The full value will be realized gradually once farmers start adopting these data driven practices and decision making over a period of time.

49. As the farm data would build up and benefits start getting released, there would be an uptake from the farmers to invest more and reap higher benefits through better seeds, crop management practices, chemicals etc. The program therefore intends to support such needs by bringing some financial institutions as well as off takers of the selected commodity in the value chain on the shared digital platform so that the collective risk can be reduced for the stakeholders. Technology will play as a key enabler in terms of data interoperability, building economic and financial profiles based on historical, present and future agriculture performance

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- [4] Lowder, S., Scoet, J., and Raney T. (November 2016). "The number, size and distribution of Farms, Smallholder Farms, and Family Farms Worldwide". World Development, 87, pp. 16-29
- [5] Cooper, P. and Coe, R. (2011). "Assessing and Addressing Climate-induced Risk in Sub-Saharan Rainfed Agriculture", Experimental Agriculture.
- [6] Shakhovskoy, M. and Mehta, R. (17 September 2018). "Protecting growing prosperity: Agricultural insurance in the developing world", Rural and Agricultural Finance Learning Lab.
- [7] Langyintuo, A.S. et al. (2010). "Challenges of the maize seed industry in eastern and southern Africa: A compelling case for private/public intervention to promote growth", Food Policy 35(4), 323-331.
- [8] In Ethiopia, SMARTFARM will focus on high value crops in the irrigated command area of the project such as potatoes, tomatoes, onions and fruit trees like avocado and banana. In addition, other crops will also be covered in the rain fed areas such as wheat, rice, maize and beans.
- [9] In Rwanda, SMARTFARM will focus on high value crops in the irrigated command area of the project such as fruit trees (Mangos, avocados, Tree tomato etc.) In addition, other crops will also be covered in the rain fed areas such as Cassava, Irish Potato, Sweet Potato and Beans.

1b. Project Map and Coordinates

Please provide geo-referenced information and map where the project interventions will take place.



The designations employed and the presentation of the material in this map do not imply the expression of any opinion whatsoever on the part of IFAD concerning the delimitation of the frontiers or boundaries, or the authorities thereof.
 Map compiled by IFAD | 15-12-2022

Geographical area of intervention ? In Ethiopia, SMARTFARM will be implemented in four regions (Amhara, Oromia, Southern Nations, Nationalities Peoples Region ?SNNPR and Tigray) 110 Woredas

under PASIDP II, while under PACT the solution will be implemented in five regional states (Amhara, Oromia, SNNPR, Sidama and Somali) and 90 food insecure woredas as per programme design.

In Rwanda, SMARTFARM will be implemented in nine drought-prone Sectors of Kayanza District. Project sites will be selected based on the level of degradation, topography and water availability and viability of the site for development which is in conformity with the KIIWP I&II project design targeting strategy.

1c. Child Project?

If this is a child project under a program, describe how the components contribute to the overall program impact.

2. Stakeholders

Select the stakeholders that have participated in consultations during the project identification phase:

Civil Society Organizations Yes

Indigenous Peoples and Local Communities Yes

Private Sector Entities Yes

If none of the above, please explain why:

Please provide the Stakeholder Engagement Plan or equivalent assessment.

The Ministry of Agriculture through the Department of Extension Services in Ethiopia and the Ministry of Agriculture and Animal Resources (MINAGRI) and Rwanda Agriculture and Animal Resources Board (RAB) will act as lead country level agencies for the implementation of SMARTFARM under the main recipient CropIn. Through coordination with the anchor Project Management Unit(s) the different stakeholders will be engaged at different levels of the project implementation.

In addition, provide a summary on how stakeholders will be consulted in project execution, the means and timing of engagement, how information will be disseminated, and an explanation of any resource requirements throughout the project/program cycle to ensure proper and meaningful stakeholder engagement

A multi-stakeholder Programme Steering Committee chaired by the representatives from the GEF, IFAD & CropIn will be established to provide Programme oversight, direction, and advice for the Project. The Ministries of Agriculture have been key in the consultations for the design as well as engagements with other stakeholders to define project interventions. The PSC will be mutually selected by the three agencies and the Ministries after consultations and effort will be made to keep the

continuation to implementation stage. The multi stakeholder composition of the PSC will ensure the Programme's implementation complements rather than duplicates other GEF, IFAD & Govts interventions, provides check and balances and continuous review, and harmonizes the Programme's contribution with the GEF, IFAD, & Govts strategic priorities and development objectives.

The following table illustrates the Stakeholder assessment conducted and the role of each of the stakeholders in the Project implementation

Stakeholder	Responsibility	Role in Project	Consultation methodology and role
Key Stakeholders in Ethiopia			
PASIDP II and PACT:	IFAD funded project in Ethiopia. Key project partners with implementation arrangements in the regions and woredas	To provide support in mobilization of lead farmers, producer co-operatives and co-operative unions	During project preparation and will be part of working groups for implementation of the project,
Ministry of Agriculture (MoA)	MOA is the key project implementation agency for PASDIP I and II, PACT	MoA will act as an anchor agency for implementing the SMARTFARM technology. MoA also has access to district level maps and data on smallholder farmers and their specific needs for the targeted value chains in the four project targeted regions. To provide support for on-boarding farmers through lead farmers/FFS groups	During project preparation and throughout the project

MOA, Directorate of Extension	The Directorate of Extension is concerned with the provision of agricultural extension and advisory services to address the challenges of agricultural production system sustainability and also to provide advisory on agricultural technologies or inputs in order to increase agricultural productivity.	To lead in provision of digital extension and to also share experiences of implementing digital extension in Ethiopia	During project preparation and they have also agreed to host SMARTFARM and provide dedicated manpower
National Meteorology Agency (NMA)	Concerned with provision of weather and climate data and weather forecasts and dissemination of these data to the regions.	To support in provision of climate and weather information and alerts to the project	During implementation
ATI ? Agriculture Transformation Institute	Working under MOA and the Directorate of Extension, ATI has been implementing digital solutions in agriculture since 2013 and has data on appropriate context specific recommendations for various sites based on historical information.	To share experiences of implementing digital extension in Ethiopia	During project preparation and will be partners during implementation.

FCA ? Federal Cooperative Agency	Has the mandate of working with producer and marketing cooperatives in Ethiopia.	Has information on active and vibrant co-operatives that can be on-boarded to the SMARTFARM system.	Through ongoing projects (PASADIP and PACT) 2
Digital Green	Digital Green, an Organization that has been in partnership with MoA in supporting exchange of knowledge, and linking researchers, extension agents and farmers through digital channels ? videos, radio and mobile phones to deliver information on environmentally sustainable agronomic practices and nutrition behaviors.	To share experiences of implementing digital extension in Ethiopia	During implementation
Key Stakeholders in Rwanda			
Ministry of Agriculture and Animal Resources (MINAGRI) and Rwanda Agriculture and Animal Resources Board (RAB)	MINAGRI and RAB are the key project implementation agency for KIIWP I & II	Proposed as the anchor agency for implementing the SMARTFARM technology; MINAGRI and RAB have access to district level maps and data on smallholder farmers and their specific needs for the targeted value chains Kayonza District	During project preperation and throughout the project
KIIWP I & II Projects	IFAD funded project in Rwanda. Key project partners with implementation arrangements in Kayonza District	To provide support in mobilization of lead farmers, FFS groups and farmer co-operatives	During project preperation and will be part of working groups for implementation of the project,

ICCO/CORDAID	Co-financier & service provider, knowledge management- Provision of farming-as-a-business training, capacity building of cooperatives, business development services and coaching; Provision of financial services through institutional capacity building, innovative products, financial literacy training, and digitalization; support on VSLA.	<p>Proposed as the lead agency for implementing the SMARTFARM technology;</p> <p>To provide support for on-boarding farmers through lead farmers/FFS groups;</p> <p>ICCO is a recipient of the South-South Triangular Cooperation (SSTC) China Facility grant and will be implementing the "Strengthening Agricultural Resilience through Learning and Innovation (STARLIT)" project in Rwanda. IFAD and ICCO worked closely together during KIIWP2 design to ensure complementarity between KIIWP2 and STARLIT.</p>	During implementation through the ongoing project.
WFP (SMART and FtMA projects)	Supports capacity building and exchanges on nutrition-sensitive and climate-smart practices, promotion of nutritious foods and market linkages through HGSFP, community mobilization and engagement and linking to finance support.	<p>To support SMARTFARM project through market analysis and selection of nutrient rich crops with potential for local market and public procurement;</p> <p>Access to quality seeds and improved seeds, coupled with insurance (potential facilitation by WFP in coordination with RAB;</p> <p>Capacity building of cooperatives, post-harvest capacity, synergies to link financial products of MFIs and SACCOs with VSLAs within the targeted cooperatives, linkages between SMEs crowded into the FtMA.</p>	During implementation. Lessons learning and leverage exsiting information.
FAO	Sharing of knowledge, specialized facilitators.	Potential technical assistance on FFS ToT, mechanization, nutrition education, CSA practices.	During implementation. Lessons learning and leverage exsiting information.

AGRA	Sharing of knowledge on CSAs and adoption of CSA technologies (seeds and fertilizer).	Support with farmers? linkages to markets and private sector; capacity building of government staff and institutions; access to/digitalization of financial services; and policy and Institutional development.	During implementation. Lessons learning and for agribusiness linkages
One Acre Fund	Sharing of knowledge and lesson learned in irrigation development; potential scaling-up through coordination with KIIWP2.	Sharing of knowledge regarding credit, building market linkages.	During implementation. Lessons learning and for agribusiness linkages

Select what role civil society will play in the project:

Consulted only; Yes

Member of Advisory Body; Contractor;

Co-financier;

Member of project steering committee or equivalent decision-making body;

Executor or co-executor;

Other (Please explain)

3. Gender Equality and Women's Empowerment

Provide the gender analysis or equivalent socio-economic assesment.

1. Ethiopia is ranked 125th out of 162 countries on the Gender Inequality Index (GII), which reflects gender-based inequalities in health, empowerment and economic dimensions. Contributing factors include discriminatory social norms and limited access to quality services among others. In the agricultural sector, although women make up more than 40 percent of the labour force and head approximately 25 percent of all farming households, women's productivity is 36 percent lower than of men. Rwanda on the other hand ranks 0.81 on the global gender gap index representing gender distribution between men and women across sectors. However, as the Agriculture contributes 28% of Rwandan GDP and accounts for almost 80% of the female labour force with the majority undertaking subsistence farming and own a very small plot of land which resulted to a big gender disparity between women's and men's participation

in agricultural activities. The gender gap in education and literacy is another root cause of women's lack of economic opportunities. On the other hand, in Ethiopia extension services are available to less than 15% of rural households. Extension staff lack resources, are neither demand-driven nor gender-sensitive, and focus exclusively on agricultural techniques, leaving out critical elements such as marketing information, management and conflict resolution

2. As per the design of PASIDP and PACT and in alignment with KIIWP I & II design, SMARTFARM target beneficiaries will include women (50%), youth (40%) and Persons Living with Disability-PWD (5%). The primary target group will also include: a) Poor households (with land holding less than 2ha of cultivable land with limited livestock); b) pastoralists; c) agro-pastoralists engaged in less diversified traditional livelihood systems; d) PWD in rural areas; e) rural underemployed and unemployed youths owning no or small land; and f) female headed households.

3. Considering that Women play a major role in agricultural production and marketing in rural areas. While they are not usually involved in land preparation, they are involved directly in all aspects of crop production. The capacity building activities under SMARTFARM will ensure participation of women. The project will mainstream gender and ensuring that digital climate and weather advisories are inclusive.

4. During Project Implementation issues of gender and social inclusion will be critical, the Project PMU will ensure measures that include women participation of access to digital services are encouraged. The Village Based Advisors (VBAs) and provision of extension services will also target women and youth.

5. Under the project, these measures will include: (i) training and capacity building of the PMU and implementing partners on the promotion of gender equality and social inclusion; (iii) inclusion of women as Village Based Advisors and lead farmers; (iv) the preparation of knowledge products that promote the inclusion of women and young people (v) the inclusion of women at the project startup.

Does the project expect to include any gender-responsive measures to address gender gaps or promote gender equality and women empowerment?

Yes

Closing gender gaps in access to and control over natural resources;

Improving women's participation and decision making

Generating socio-economic benefits or services for women Yes

Does the project's results framework or logical framework include gender-sensitive indicators?

Yes

4. Private sector engagement

Elaborate on the private sector's engagement in the project, if any.

1. ***The project intends to build a sustainable, replicable, and scalable digital climate adaptation model, that serves as farm and farm management solution and evidence based decision-making support system for smallholder farmers towards climate change*** and includes the following: -

-Access to weather and climate information services (WACS), data-driven agriculture services (DDAS), and agri-digital financial services (Agri-DAFS) and digital agri-market services (DAMS).

-Active participation of private-sector (financial institutions and off-takers buyers) by risks and cost sharing, and trust and confidence building based on data and evidence for the benefit of smallholder farmers.

-Strengthening institutional capacity of identified lead farmers? organization/producer company and/or rural institutions, and governments for income & livelihood generation, agri-worthiness, increase in productivity, food & nutrition security and long-term asset creation and sustainability.

Simultaneously, the digital intervention intends to provide reciprocal benefits to the financial institutions and market off-takers to participate in the agri-value chain by providing last mile delivery of their services to smallholder farmers.

To achieve the above stated objective, the project will engage with private sector for partnerships and fundraising to tune of \$8-10 million (\$35/farmer/year engagement) for full scale module services (WACS, DDAS, Agri-DFS, DAMS) by sharing data and evidence with following private sector:

-Banking institutions ? to offer innovative credit lines to small holder farmers.

-Insurance institutions ? to offer safety nets in the form of climate-index insurance products for covering climate related risks faced by smallholder farmers.

-Buyers and off-takers ? to offer better prices and stable markets for farmers by completing farm to fork traceability and horizon on harvest and yield for off-takers and buyers to participate in business relationships with smallholder farmers institutions.

-Agritechs, fintech, and international development institutions ? to support better digital services to smallholder farmers and providing cash, in-kind, programme development support to the project and scaling to other regions.

5. Risks to Achieving Project Objectives

Elaborate on indicated risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and, if possible, the proposed measures that address these risks at the time of project implementation.(table format acceptable):

1)Integrated Project Risk Matrix (IPRM) - Ethiopia

Risk Categories and Subcategories	Inherent	Residual
Country Context		
Political Commitment	High	Moderate
Risk: The current political instability expected to remain high for some time in 2022, given the ongoing civil conflict in Tigray, Amhara and Afar regions. There is also localized conflict between unidentified armed groups and federal government in Oromia and Benshangul Gumuz regions. This will lead to inaccessibility of these regions and stoppage of project design and implementation.		
Mitigations: The African Union is forging ahead with mediation talks in Ethiopia to resolve the issues. There is also initiative from the GoE side to have a national dialogue which is believed to maintain peace, justice, democracy, national unity, consensus and reconciliation among the Ethiopian peoples. PACT will take a phased and gradual approach to implementation, and will assess risks before expanding to conflict-affected areas.		
Governance	Moderate	Low
Risk: Governance structures of government, community stakeholders, private sector and other stakeholders engaged in project activities may not equally benefit all segments of the community, resulting in elite capture.		
Mitigations: The project will foster collaboration between government institutions, private sector players and farmers; supporting the development of mutually beneficial partnerships. Adequate planning, implementation and monitoring of activities will ensure stakeholders' engagement in the development of financially viable irrigation schemes and to promote farming as a business.		
Macroeconomic	High	High
Risk: Unstable macro-economic fundamentals. According to African Economic Outlook (AOE) 2021, Ethiopia's economy grew by 6.1 percent in 2020. The fiscal deficit, including grants, increased slightly during 2020, financed mainly by treasury bills. In 2021, the average inflation rate in Ethiopia was 26.78 percent as compared to the previous year. The official exchange rate is under pressure and devaluing steadily. Service sector exports declined by about 6 percent, mostly because of lower revenue from Ethiopian Airlines. Foreign direct investment (FDI) fell 20 percent to 2.2 percent of GDP, and personal remittances declined by 10 percent to 5.3 percent of GDP. The current conflict in country and the war in Ukraine, will worsen the situation.		
Mitigations: The Monetary policy is expected to remain flexible in response to the government's financing requirements. The government is expected to do further reforms in public finance and investment management to improve the efficiency of public expenditures and managing inflation. IFAD will set price contingencies at higher levels to mitigate potential price increases due to higher inflation.		

Fragility and security	High	Substantial
Risk: The conflict in North Ethiopia is not yet been resolved. There are internal conflicts in some areas in Oromia, Benshangul Gumuz. Furthermore, there were clashes between government and Al-Shabaab in Somali regions. The country is also vulnerable to recurrent drought and flooding with devastating impacts.		
Mitigations: There is a hope that the current effort by African Union to mediate talks between the federal government and TPLF will end the conflict. Moreover, the initiative from the GoE to have a national dialogue which is believed to maintain peace, justice, democracy, national unity, consensus and reconciliation among the Ethiopian peoples will address localized conflict. PACT will be implemented in regions that are not highly impacted by the internal war. Climate screening was undertaken and climate resilience measures are included in the programme to reduce, if not avoid, climate impacts.		
Sector Strategies and Policies		
Policy alignment	Moderate	Moderate
Risk: Primarily, there is the Ten-Year perspective plan of Ethiopia (2021-2030)) guiding the overall country's plan for five years. Specifically, there is also Agriculture & Rural Development Policies & Strategies to guide efforts and investments in smallholder focused investment. There is a regulatory framework to promote private sector engagement. However, the actual implementation of these policies is lagging behind in some regions because of the current situation in the country.		
Mitigations: In order to address the risk associated with implementation of the policies, the project will assist the Government in setting up a vibrant monitoring tool to see how effective the policies are implemented		
Policy Development and Implementation	Moderate	Moderate
Risk(s): Identified gaps in terms of operationalization of new policies, laws, regulations and institutional framework will be addressed with SMARTFARM and KIIWP support. To this end, the project is expected to conduct an evaluation of implementation and impact of new or existing policies related to the project activities with relevant national, and district level stakeholders.		
Mitigations: SMARTFARM will also work alongside KIIWP2 in supporting and promoting in coordination with the World Bank (WB) agricultural insurance as offered by NAIS. This may provide valuable insights to enhancing policy dialogue on agricultural insurance and other risk mitigation strategies and instruments.		
Environment and Climate Context		
Project vulnerability to environmental conditions	Substantial	Moderate

Risk: Land degradation is increasing at an alarming rate. The most important forms of land degradation are soil erosion, nutrient depletion, soil compaction, and increased salinization and acidity. The annual net erosion is 940 million tons a year, or 18 tons/ha/year and it may be increased by 7-10 percent per year. Approximately 11 million ha of land are salt affected soils. The current rate of deforestation is estimated at 150,000 to 200,000 hectares per year		
Mitigations: Integrated Natural Resource Management activities will be implemented by the project as well as through the finance from IGREENFIN and ASAP+. The most important and appropriate mitigation actions will be physical and biological soil and water conservation activities, climate smart agriculture, landscape management including forestation and afforestation activities. Good lessons from PASIDP II (ASAP) will be scaled up.		
Project vulnerability to climate change impacts	Substantial	Moderate
Risk: Ethiopia is the most vulnerable country to the impact of climate change. According to World Vulnerability Index and ND-GAIN Matrix, Ethiopia is the 19th most vulnerable and 34th least ready country to the impact of climate change in the world Climate variabilities, in the form of flood and drought, have long been affecting crop, livestock and forestry productivity, infrastructures, livelihood, water availability.		
Mitigations: SMARTFARM promotes adaptation to climate change through provision of climate and weather alerts and data and promotion of CSA activities. Project beneficiaries will be trained on climate risk and climate risk management and will receive climate information coupled with agricultural advisories.		
Project Scope		
Project relevance	Low	Low
Risk: The project is designed based on the available national policies and strategies on agriculture, climate change and water and energy. It has also adequately aligned to the recently approved ten-year strategic plan.		
Mitigations: Further alignment with the national adaptation plan (NAP), Nationally Determined contributions (NDCs), Climate Resilient Green Economy Strategy (CRGE) is needed.		
Technical soundness	Moderate	Moderate
Risk(s): This risks entails the advisories on digital technologies not working and not delivering the expected results or are not cost-effective.		

Mitigations: To enable mitigation of technology risks a review of technological architecture will be conducted and an integration with Databases in the Ministry of Agriculture will be done. This process will also include proportionality and segregation of data that will be managed by MoA to mitigate data privacy issues. In addition, it is also proposed that capacity building of staff on digital technologies will be carried out in addition to raising awareness of cybersecurity and data protection issues and robust and accurate data collection through effective point of collection and with clear accountabilities.		
Institutional Capacity for Implementation & Sustainability		
Impl?mentation arrangements	Moderate	Moderate
Risk: Institutions are available to support SMARTFARM but there might be a lack of adequate capacity in terms of manpower, skill, infrastructure as well as systems particularly at Region and Woreda level		
Mitigations: Capacity need assessment and tailored capacity development program, experience sharing, lessons from similar projects such as PASIDP II		
M&E arrangements	Substantial	Low
Risk(s): SMARTFARM will be implemented alongside PASIDP II and PACT and will align to the M&E system of these projects. The inclusion of new elements may stretch the capacity of the M&E for the MoA.		
Mitigations: PASIDPII has had strong performance in M&E over the years. They have also included GIS and data dashboards as part of their M&E framework. To support SMARTFARM, the project will include capacity for ICT4D in the project staff. These will be supported by expert partnerships.		
Procurement		
Legal and regulatory framework	Moderate	Low
Risk: Most of the central government institutions do not maintain databases or records for contracts including data on what has been procured, the value of procurement, and who has been awarded contracts. They prepare the performance report directly from the source document at the end. In addition, all central government institutions do not submit their procurement performance reports on time to the FPPA.		

<p>Mitigations: IFAD can strongly encourage government through policy dialogue to accelerate the creation of a reliable record/database for monitoring procurement management, ensuring that central government institutions prepare accurate reports and submit them to the FPPA, so that the latter can populate the database. It is also important to ensure that accuracy and completeness of reports are verified by the FPPA or by an external auditor. At project level, the systematic use of the CMT should be ensured so as to improve procurement monitoring.</p> <p>In addition, policy dialogue between IFAD and the Government should encourage the latter to improve the completeness of procurement information available to the general public. For example, the FPPA website could be used to ensure access to such information, as it is already the case for the legal and regulatory framework and bidding opportunities.</p>		
Accountability and transparency	Moderate	Low
<p>Risk: (i) Complaints are not reviewed by a body which is not involved in any capacity in procurement transactions or in the process leading to contract award decisions. Indeed, out of 5 members, only one is seen as independent, while the others are directly involved in procurement activities.</p> <p>(ii) Ethiopia has a score of 38/100 in 2020 in the Corruption Perception Index and ranked 96/198.</p>		
<p>Mitigations: The Government should be encouraged to ensure that national provisions on complaint system are applied, according to which an independent and functional system should be available. Members of the Complaint Review Board should be selected accordingly.</p> <p>(ii) Programme and the Lead executing agency to ensure that any individuals, firms and Government stakeholders involved in the implementation of PACT are well informed of the Revised IFAD's Policy on Preventing Fraud and Corruption in its activities and operations.</p>		
Capability in public procurement	Low	Low
Risk(s): No risk identified		
Mitigations: No mitigating actions needed		
Public procurement processes	Moderate	Low
<p>Risk: (i) The PP for the current IFAD project (PASIDP II) was significantly delayed by late preparation of the AWPB. (ii) In the current IFAD project (PASIDP II), there are pseudo packaging as lotted activities are conducted separately in different implementing regions and there are instances where the planned procurement method has not been put to use.</p>		

Mitigations: Mitigations: (i) The Lead executing agency to ensure that procurement planning and AWPB are joint activities between the procurement, finance and technical officers to ensure consistence and alignment of activities, guided by programme technical delivery to inform procurement plan and financial flow projections.		
Financial Management		
Organization and staffing	Moderate	Low
Risk(s): The risk that staff needs in terms of numbers and skills are not adequate and there is no segregation of duties.		
Mitigations: SMARTFARM will employ at least two accountants to ensure segregation of accounting duties. There will be a designated person in charge of FM aspects at Recipient PMU level, in charge of i.a. consolidating input received from anchor units.		
Budgeting	Moderate	Moderate
Risk(s): This risks entails the actual project needs significantly exceeding the initial budget.		
Mitigations: This risk will be mitigated through thorough building of clear scope of work and deliverables with defined budgets, conducting analysis with mitigating measures at the project design stage with concrete project implementation plan and having robust project budget management and control procedures together with mobilizing partnerships with governments, international development institutions, private sector, IFIs and private sector companies to leverage more resources.		
Funds flow/disbursement arrangements	Substantial	Moderate
Risk(s): The risk that i) allocated funds will not be absorbed and that some expenditure will not be financed because categories are overdrawn and ii) complex funds flow structure with multiple approvals required, leading to i.a. delays in implmenetation.		
Mitigations: Initiate a project extension request where necessary or initiate a request for reallocation of funds where properly justified to ensure funds are available for the implementation of planned activities. Ensure roles and responsibilities for disbursement procedures are well defined and communicated in relevant procedural documentation.		
Internal controls	Substantial	Moderate
Risk(s): The risk that existing controls are inadequate to safeguard project resources.		

Mitigations: The PIM will provide for requirements of interim financial reports (formats/timeline etc.), the accounting procedures and tracking of in-kind contribution. Internal controls should be tested regularly by the Recipient and IFAD will review the internal control procedures over implementation e.g. through project missions.		
Accounting and financial reporting	Substantial	Moderate
Risk(s): The risk that accounting and financial reporting are not submitted on a timely basis and/or are inadequate.		
Mitigations: The PIM will specify all required financial reporting, including timelines for submission. This will further be reflected in the Agreement entered into between IFAD and the Recipient, to ensure adherence to both IFAD and GEF reporting requirements.		
External audit	Moderate	Low
Risk(s): The risk that audit quality will be of poor quality and/or will not be submitted on a timely basis.		
Mitigations: The audit reporting should be submitted no later than 6 months after the end of the fiscal year.		
Environment, Social and Climate Impact	Moderate	Low
Risk: Climate change, use of agrochemicals as well as use of forest clearance may cause loss of biodiversity		
Mitigations: Budgeted Climate adaptation and mitigation measures are adequately integrated into project components. As part of the ESCMF, Integrated Pest Management Plan is prepared to ensure environmentally friendly applications of agrochemicals. screening and implementation of mitigation measures, integrated pest management system and compliance to SECAP and national law on environment		
Resource efficiency and pollution prevention	Substantial	Moderate
Risk(s): water and soil pollution due to increased use of agrochemicals		
Mitigations: SMARTFARM will promoted implementation of Integrated Pest Management Plan and promotion of organic fertilizer and good agricultural practices.		
Cultural heritage	N/A	N/A
Risk(s): N/A		
Mitigations: N/A		

Indigenous Peoples	N/A	N/A
Risk(s): There are not Indigenous Peoples living in Project area, therefore no risk has been detected on this issue.		
Mitigations: N/A		
Community health and safety	Moderate	Low
Risk(s): Promotion of fruit trees as cash crops may reduce diet diversity		
Mitigations: food crops will be promoted in parallel with cash crops		
Labour and working conditions	Moderate	Low
Risk(s): in-migration due to potential job opportunities and spin off employment activities.		
Mitigations: SMARTFARM will use lead farmers who are members of FFS groups		
Physical and economic resettlement	N/A	N/A
Risk(s): N/A.		
Mitigations: N/A		
Greenhouse gas emissions	Moderate	Low
Risk(s): a) Excessive use of fertilizers where unabsorbed ammonia and nitrates may subsequently be released into the air. b) Tilling land releases carbon stored in soil.		
Mitigations: Adopt zero tillage so carbon is stored in soils, and less carbon released to the air Implementation of Integrated Pest Management Plan(IPMP)		
Vulnerability of target populations and ecosystems to climate variability and hazards	Moderate	Low
Risk(s): Population has suffered from extreme events (droughts) in 2016 and 2017.		

Mitigations: SMARTFARM promotes adaptation to climate change through provision of climate and weather alerts and data and promotion of CSA activities. Project beneficiaries will be trained on climate risk and climate risk management and will receive climate information coupled with agricultural advisories.		
Stakeholder engagement/coordination	Substantial	Moderate
Risk(s): This risks entails lack of support from government and key stakeholders, lack of interest to invest in poor remote areas by private sector partners and lack of understanding of local context by digital technology developers.		
Mitigations: This risk will be mitigated through raising awareness on the importance and urgency of digital technology stressing that digital technology is key for acceleration of agriculture outcomes, and for achieving the SDGs. Further, strong engagement with governments, international development institutions, private sector, IFIs and service providers will be critical. It will also be necessary to perform an inventory of applicable laws and technical standards on privacy protection and cyber security while also actively engaging with government and key stakeholders through capacity building and sharing digital technology success stories. It will be necessary to have very strict and clear rules about the terms of partnerships and the use of data and protection of the users.		
Stakeholder grievances	Substantial	Moderate
Risk(s): Potential conflicts may arise among water users, between outside workers and local community		
Mitigations: To mitigate risks and to ensure transparency and fairness of project interventions, a Grievance Redress Management (GRM) system will be established and the project will ensure awareness and adherence to the GRM procedures. The project GRM system will be spearheaded by Grievance Resolution Committee (GRC) established in the project implementation areas to inform and coordinate the relevant stakeholders and to provide resources for resolution.		

Integrated Project Risk Matrix (IPRM) - Rwanda

Risk Categories and Subcategories	Inherent	Residual
Country Context		
Political Commitment	Low	Low

<p>Risk(s): 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. The next legislative and presidential elections are due in 2023 and 2024 respectively. Counterpart funding in some previous IFAD-supported projects has materialized below the expected levels.</p> <p>In addition, the SMARTFARM Project will need to ensure that decisions made by FFS groups and cooperatives reflect the opinion of their members and active participation by all.</p>		
<p>Mitigations: GoR has already demonstrated strong commitment in co-financing KIIWP1 & 2 Projects, which are heavy on infrastructure. GoR committed to provide cash contribution for taxes on a timely basis and report promptly on any in-kind contributions including taxes waived whenever government agencies are used to implement activities.</p>		
Governance	Low	Low
<p>Risk(s): Over the last 20 years, Rwanda has enjoyed political stability which, combined with good governance and policy consistency. Transparency International's Country Corruption Perception Index score puts Rwanda at medium risk in terms of corruption (54 points in 2020). Guided by the Vision 2020 and the Economic Development and Poverty Reduction Strategy, since the year 2000, the Rwandan government has been implementing a comprehensive and ambitious decentralization reform, which materialized by the adoption of the National Decentralization Policy. The policy's objective was the promotion of good governance, the reduction of poverty as well as the promotion of efficient, effective, and accountable service delivery. While progress has been achieved through strengthening the capacities of districts and the territorial reorganization of decentralized state entities, some challenges still persist. In order to mitigate the infection, spread of COVID-19, the Government imposed strict contingency measures including total or partial lockdowns, border closures, and restriction of movements. While these measures were necessary for public safety, they may pose risks on project implementation.</p>		
<p>Mitigations: GoR has enhanced its efforts to prevent corruption by identifying and reducing vulnerability to corruption. A number of multi-stakeholder consultative bodies have been established, including the National Council to fight against Corruption and Injustice and Corruption Advisory Councils at national, district, sector, and cell levels. KIIWP1 and KIIWP2 will contribute to enhancing the quality of governance at the district level.</p> <p>Stakeholder participation is done by: (i) participatory community-driven preparation of sub-catchment plans; (ii) strengthened FFS, cooperatives, Infrastructure Management Institutions; (iii) development of Water User Committees and Water User Organizations.</p>		
Macroeconomic	Moderate	Low

<p><u>Risk(s):</u> COVID-19, and subsequent measures to contain the spread of the virus, deepened the country's economic slowdown such that real GDP growth was slightly negative at -0.2 percent in 2020. However, the country experienced a rebound in real GDP growth to 5.7 percent in 2021, albeit below potential. In addition, Rwanda's heavy reliance on large public investments (12.3% of gross domestic product [GDP] in 2019) led to substantial fiscal deficits financed mainly through external borrowing. Consequently, the debt-to-GDP ratio rose to 56.7% in 2019 (from 19.4% in 2010) and is estimated to have reached 71.3% of GDP in 2020, following an increase in borrowing needs due to the pandemic. The latest available data show an unemployment rate of 22.1% in May 2020, compared with 15% in 2019. Unemployment growth reflects the virtual shutdown of major businesses like transport, hospitality, processing units, etc. during the lockdown and is like to increase the poverty rate.</p>		
<p><u>Mitigations:</u> SMARTFARM, KIIWP I & II promote increased and diversified agricultural production to enhance farmers' resilience to a wide range of shocks and to address poverty and increase in productivity and improvement in food security and nutrition.</p>		
Fragility and security	Substantial	Moderate
<p><u>Risk(s):</u> Kayonza District faces climate-induced fragility is a drought-prone area, which impacts on the livelihoods of the population while COVID-19 may continue to pose social, economic, and health risks.</p>		
<p><u>Mitigations:</u> SMARTFARM being implemented alongside KIIWP will significantly reduce the climate-related fragility and drought problem in Kayonza District by several measures including (i) improving access to water for agriculture, livestock and rural population; (ii) promoting climate-smart agriculture (CSA) technologies and practices; (iii) training beneficiaries on climate risk and its management; and (iv) supporting and promoting understanding of agricultural insurance products offered by National Agricultural Insurances Scheme (NAIS).</p>		
Sector Strategies and Policies		
Policy alignment	Low	Low
<p><u>Risk(s):</u> The policy environment surrounding SMARTFARM and KIIWP I&II is anchored on the Rwanda National Environment and Climate Change Policy which reaffirms the country's commitment to address climate change and the resolve to lessen the potential hardships that climate change may pose to the sustainable development of the country. The policy, therefore, seeks to provide strategic direction on environment and climate change in Rwanda, bearing in mind its linkages with socio-economic development.</p>		

Mitigations: Under KIIWP 1 the project ensured the active participation of key development partners (District, RAB, Rwanda Water Board, Rwanda Meteorological Agency, Rwanda Environment Management Authority (REMA) to align its interventions with the country's policy and strategic plans especially the National Environment and Climate Change Policy. SMARTFARM aligned to KIIWP2 will also be aligned to these policies while supporting policy dialogues through an evaluation of implementation and impact of new or existing policies related to the project activities.		
Policy development & implementation	Moderate	Moderate
Risk(s): Identified gaps in terms of operationalization of new policies, laws, regulations and institutional framework will be addressed with SMARTFARM and KIIWP support. To this end, the project is expected to conduct an evaluation of implementation and impact of new or existing policies related to the project activities with relevant national, and district level stakeholders.		
Mitigations: SMARTFARM will also work alongside KIIWP2 in supporting and promoting in coordination with the World Bank (WB) agricultural insurance as offered by NAIS. This may provide valuable insights to enhancing policy dialogue on agricultural insurance and other risk mitigation strategies and instruments.		
Environment and Climate Context		
Project vulnerability to environmental conditions	Moderate	Low
Risk(s): Growing population and associated pressure on agricultural lands and grazing areas. Because of the growing pressure on farm land, deforestation in Kayonza District has by far surpassed afforestation and grazing areas are shrinking.		
Mitigations: The delivery of weather and climate alerts together with promotion of CSA under SMARTFARM is expected to lead to environmental rejuvenation and returns on improved soil and sustainable access to water.		
Project vulnerability to climate change impacts	Substantial	Moderate
Risk(s): Increased frequency of drought in Eastern province. Kayonza District is characterized by high frequency of rainfall deficit, late rainfall onsets, early rainfall cessations, and is prone to drought. Droughts are responsible for famine and food shortages, a reduction in plant and animal species and displacement of people in search of food and pasture.		
Mitigations: SMARTFARM promotes adaptation to climate change through provision of climate and weather alerts and data and promotion of CSA activities. Project beneficiaries will be trained on climate risk and climate risk management and will receive climate information coupled with agricultural advisories.		
Project Scope		
Project relevance		

<p>Risk(s): SMARTFARM seeks to make real-time weather and climate data along with data-driven advisory to smallholder farmers in Ethiopia and Rwanda, hence increasing adoption of climate resilience agriculture practices and enhancing rural communities' resilience to climate change. The main risk risks entail the projects failing to achieve the anticipated results such as advisories received not being converted into action plans. There is also a risk of lack of interest and trust in the stakeholders about digital technologies as they fail to see value. There is a potential risk of lack of motivation and incentive to keep pace with upgradation in the fast-changing technology landscape. In addition, there might be individual hindrance due to privacy issues and there also a risk of farmers lacking the willingness to adopt new climate smart agricultural practices.</p>		
<p>Mitigations: This risks will be mitigated through Identifying pioneer farmers that are interested in adopting a new technology or set-up demo plots which will cause low risk for farmers. It is also proposed that capacity building and training be done to minimize risk of farmers and stakeholders not taking interest in the technology. Finally, it will be important to consult and involve the main target/user groups in the development of the technology implementation plan. The Project Management Units under the MoA will be key anchor for the project implementation working with the key beneficiaries.</p>		
Technical soundness	Moderate	Moderate
<p>Risk(s): This risks entails the advisories on digital technologies not working and not delivering the expected results or are not cost-effective.</p>		
<p>Mitigations: To enable mitigation of technology risks a review of technological architecture will be conducted and an integration with Databases in the Ministry of Agriculture will be done. This process will also include proportionality and segregation of data that will be managed by MoA to mitigate data privacy issues. In addition, it is also proposed that capacity building of staff on digital technologies will be carried out in addition to raising awareness of cybersecurity and data protection issues and robust and accurate data collection through effective point of collection and with clear accountabilities.</p>		
Institutional Capacity for Implementation & Sustainability		
Implementation arrangements		
<p>Risk(s): This risk may involve poor Information and Communications Technology (ICT) infrastructure in rural areas and lack of understanding and knowledge of ICT in addition to lack of ICT security management and inaccurate or incomplete data.</p>		
<p>Mitigations: These risks will be mitigated by defining realistic targets by taking into consideration ICT infrastructure and technology readiness adoption, leveraging on digital technology partnerships to speed up investments in infrastructure and provision by CropIn technologies of its platforms in the Proof-of-concept stage as an in-kind contribution.</p>		
M&E arrangements	Moderate	Moderate

Risk(s): SMARTFARM will be implemented alongside KIIWP and will align to the KIIWP M&E system. The KIIWP M & E system is presently not guided by an M& E plan in which data collection and general M & E arrangements would be defined. The system also has challenges of inconsistent and low-quality data to support management decisions. Staff capacity for and appreciation of results-based M & E management is low. The system also relies on manual data management in Microsoft Excel, with limitations in data manipulation and capacity for handling large volumes of data.		
Mitigations: A comprehensive M & E framework and plan will be developed under SMARTFARM and KIIWP 2 to provide overall guidance for the project M & System. SMARTFARM will also build the capacity of M & E Staff through training, coaching and mentoring on results-based M & E management, data management and quality assurance		
Procurement		
Legal and regulatory framework	Low	Low
Risk(s): No risks identified		
Mitigations: No mitigating actions needed		
Accountability and transparency	Low	Low
Risk(s): The 2020 country corruption index published by Transparency International, assigned a score of 54/100 to Rwanda, putting the country at medium risk.		
Mitigations: All procurement entities, as well as bidders, suppliers, contractors, consultants and service providers, shall observe the highest standard of ethics during the procurement and execution of contracts financed under IFAD funded Projects, in accordance with paragraph 69 of the IFAD Project Procurement Guidelines. The Revised IFAD Policy on Preventing Fraud and Corruption in its Activities and Operations shall apply to all projects, vendors and third parties, in addition to the relevant national anticorruption and fraud laws.		
Capability in public procurement	Low	Low
Risk(s): No risk identified		
Mitigations: No mitigating actions needed		
Public procurement processes	Low	Low
Risk(s): The procurement methods for goods and works to be used will be consistent with IFAD's Project Procurement Guidelines. However, there is a potential risk for delayed procurement processes by the use of open tendering for low-value procurements in case the local ? RPPA are applied.		

Mitigations: There is need to negotiate with RPPA to increase procurement to be applied to SMARTFARM.		
Financial Management		
Organization and staffing	Moderate	Low
Risk(s): The risk that staff needs in terms of numbers and skills are not adequate and there is no segregation of duties.		
Mitigations: SMARTFARM will employ at least two accountants to ensure segregation of accounting duties. There will be a designated person in charge of FM aspects at Recipient PMU level, in charge of i.a. consolidating input received from anchor units.		
Budgeting	Moderate	Moderate
Risk(s): This risks entails the actual project needs significantly exceeding the initial budget.		
Mitigations: This risk will be mitigated through thorough building of clear scope of work and deliverables with defined budgets, conducting analysis with mitigating measures at the project design stage with concrete project implementation plan and having robust project budget management and control procedures together with mobilizing partnerships with governments, international development institutions, private sector, IFIs and private sector companies to leverage more resources.		
Funds flow/disbursement arrangements	Substantial	Moderate
Risk(s): The risk that i) allocated funds will not be absorbed and that some expenditure will not be financed because categories are overdrawn and ii) complex funds flow structure with multiple approvals required, leading to i.a. delays in implmenetation.		
Mitigations: Initiate a project extension request where necessary or initiate a request for reallocation of funds where properly justified to ensure funds are available for the implementation of planned activities. Ensure roles and responsibilities for disbursement procedures are well defined and communicated in relevant procedural documentation.		
Internal controls	Substantial	Moderate
Risk(s): The risk that existing controls are inadequate to safeguard project resources.		
Mitigations: The PIM will provide for requirements of interim financial reports (formats/timeline etc.), the accounting procedures and tracking of in-kind contribution. Internal controls should be tested regularly by the Recipient and IFAD will review the internal control procedures over implementation e.g. through project missions.		
Accounting and financial reporting	Substantial	Moderate

Risk(s): The risk that accounting and financial reporting are not submitted on a timely basis and/or are inadequate.		
Mitigations: The PIM will specify all required financial reporting, including timelines for submission. This will further be reflected in the Agreement entered into between IFAD and the Recipient, to ensure adherence to both IFAD and GEF reporting requirements.		
External audit	Moderate	Low
Risk(s): The risk that audit quality will be of poor quality and/or will not be submitted on a timely basis.		
Mitigations: The audit reporting should be submitted no later than 6 months after the end of the fiscal year.		
Environment, Social and Climate Impact	Substantial	Moderate
Risk(s): SMARTFARM alongside, KIIWP1 will be implemented in the vicinity of the Akagera National Park which hosts considerable biodiversity of both fauna and flora. In addition, these agricultural lands are exposed to erosion and siltation of the marshland areas.		
Mitigations: KIIWP signed a MoU with CoEB, which has conducted the biophysical environmental baseline and recommended the key environmental indicators which should be monitored on regular basis. This assessment will efficiently guide SMARTFARM implementation and ensure biodiversity conservation and environmental protection.		
Resource efficiency and pollution prevention	Moderate	Low
Risk(s): water and soil pollution due to increased use of agro-chemicals		
Mitigations: SMARTFARM will promoted implementation of Integrated Pest Management Plan and promotion of organic fertilizer and good agricultural practices.		
Cultural heritage	N/A	N/A
Risk(s): N/A		
Mitigations: N/A		
Indigenous Peoples	N/A	N/A
Risk(s): There are not Indigenous Peoples living in Project area, therefore no risk has been detected on this issue.		
Mitigations: N/A		

Community health and safety	Moderate	Low
Risk(s): Promotion of fruit trees as cash crops may reduce diet diversity		
Mitigations: food crops will be promoted in parallel with cash crops		
Labour and working conditions	Moderate	Low
Risk(s): in-migration due to potential job opportunities and spin off employment activities.		
Mitigations: SMARTFARM will use lead farmers who are members of FFS groups		
Physical and economic resettlement	N/A	N/A
Risk(s): N/A.		
Mitigations: N/A		
Greenhouse gas emissions	Moderate	Low
Risk(s): a) Excessive use of fertilizers where unabsorbed ammonia and nitrates may subsequently be released into the air. b) Tilling land releases carbon stored in soil.		
Mitigations: Adopt zero tillage so carbon is stored in soils, and less carbon released to the air Implementation of Integrated Pest Management Plan(IPMP)		
Vulnerability of target populations and ecosystems to climate variability and hazards	Moderate	Low
Risk(s): Population has suffered from extreme events (droughts) in 2016 and 2017.		
Mitigations: SMARTFARM promotes adaptation to climate change through provision of climate and weather alerts and data and promotion of CSA activities. Project beneficiaries will be trained on climate risk and climate risk management and will receive climate information coupled with agricultural advisories.		
Stakeholder engagement/coordination	Substantial	Moderate
Risk(s): This risks entails lack of support from government and key stakeholders, lack of interest to invest in poor remote areas by private sector partners and lack of understanding of local context by digital technology developers.		

Mitigations: This risk will be mitigated through raising awareness on the importance and urgency of digital technology stressing that digital technology is key for acceleration of agriculture outcomes, and for achieving the SDGs. Further, strong engagement with governments, international development institutions, private sector, IFIs and service providers will be critical. It will also be necessary to perform an inventory of applicable laws and technical standards on privacy protection and cyber security while also actively engaging with government and key stakeholders through capacity building and sharing digital technology success stories. It will be necessary to have very strict and clear rules about the terms of partnerships and the use of data and protection of the users.		
Stakeholder grievances	Substantial	Moderate
Risk(s): Potential conflicts may arise among water users, between outside workers and local community		
Mitigations: To mitigate risks and to ensure transparency and fairness of project interventions, a Grievance Redress Management (GRM) system will be established and the project will ensure awareness and adherence to the GRM procedures. The project GRM system will be spearheaded by Grievance Resolution Committee (GRC) established in the project implementation areas to inform and coordinate the relevant stakeholders and to provide resources for resolution.		

6. Institutional Arrangement and Coordination

Describe the institutional arrangement for project implementation. Elaborate on the planned coordination with other relevant GEF-financed projects and other initiatives.

Project management and coordination

Lead Programme Executing Agency - Under the SMARTFARM Project, the lead agency for Programme implementation shall be CropIn Technology Solutions B.V (CropIn B.V) located at The Hague, Netherlands, which is a wholly owned subsidiary of CropIn Technology Solutions Pvt. Ltd, headquartered in Bangalore, India.

Project Anchor Agency ? In Ethiopia, the SMARTFARM Project will work with the Ministry of Agriculture (MoA) as the anchor agency to guide in the implementation of the technology. MoA has data on SHF and their specific needs along the targeted value chains, besides also having access to district level maps to enable onboarding of farmers to the technology platform. The Directorate of Extension under MoA will coordinate SMARTFARM implementation. The Directorate is concerned with the provision of agricultural extension and advisory services to farmers. In addition, ATI will also provide additional support. ATI working under MOA and the Directorate of Extension, has been implementing digital solutions in agriculture since 2013 and has data on appropriate context specific recommendations for various sites based on historical information. Other partners to support SMARTFARM implementation in Ethiopia include:

Federal Cooperative Agency (FCA): has the mandate of working with producer and marketing cooperatives in Ethiopia. Has information on active and vibrant co-operatives that can be on-boarded to the SMARTFARM system.

Digital Green Ethiopia: The organization has partnered with MoA in providing video enabled agri-extension service in Ethiopia.

Farm Radio International (FRI): The organization has in the past worked with MoA in providing radio programs to support agricultural extension services in Ethiopia.

In Rwanda, SMARTFARM will be implemented with MINAGRI and RAB acting as the anchor agencies and with CORDAID as a key implementation support partner. CORDAID is a co-financier & service provider under KIIWP II. CORDAID is also implementing STARLIT grant in Rwanda which is complimentary to SMARTFARM technology. Other implementation support partners in Rwanda will include the following.

Africa Improved Foods ? agribusiness partner- Agriculture inputs and knowhow for FFS training-of-trainers and provision of agribusiness agreements with cooperatives to purchase maize.

WFP (SMART and FtMA projects) ? Exchanges on nutrition-sensitive and climate-smart practices, promotion of nutritious foods and market linkages through HGSFP, community mobilization and engagement and linking to finance support. Market analysis and selection of nutrient rich crops with potential for local market and public procurement. Access to quality seeds and improved seeds, coupled with insurance (potential facilitation by WFP in coordination with RAB. Capacity building of cooperatives, post-harvest capacity, synergies to link financial products of MFIs and SACCOs with VSLAs within the targeted cooperatives, linkages between SMEs crowded into the FtMA.

FAO ? sharing of knowledge, specialized facilitators. Potential technical assistance on FFS ToT, mechanization, nutrition education, CSA practices.

One Acre Fund ? sharing of knowledge and lesson learned in irrigation development; potential scaling-up through coordination with KIIWP2. Sharing of knowledge regarding credit, building market linkages.

AGRA? sharing of knowledge. Adoption of CSA technologies (seeds and fertilizer). Farmers? linkages to markets and private sector; capacity building of government staff and institutions; access to/digitalization of financial services; and policy and Institutional development.

Project Management Unit (PMU) ? A PMU will be established by CropIn comprising of a Project Coordinator (Who will be the Lead of Development Sector Programme at CropIn BV responsible for project design and implementation work) and a person in charge of financial management tasks. Anchor PMU staff will be selected from the IFAD Projects in the respective country. These will include: - Project Officers responsible for technology, on-field managers to deliver on the three components; ICT experts; Accountant; Procurement Officer; Monitoring and Evaluation (M&E) and Knowledge Management (KM) Specialist. The PMU will be responsible for day-to-day management, preparation of Annual Work Plan and Budgets (AWPB), procurement plans, progress reporting, financial reporting, coordination of the procurement of goods, works and services. The main PMU at CropIn will be responsible for providing consolidated reporting to IFAD.

Financial Management, Procurement and Governance

IFAD will be responsible for the overall oversight of the SMARTFARM project for the funds received for the GEF grant. Funds will be disbursed to CropIn who will be the Recipient and the executing agency. CropIn will be accountable to IFAD for the financial reporting for the project as a whole as well as for financial functions for the implementation of the project in both Rwanda and Ethiopia.

The Recipient will establish a Programme Steering Committee (PSC) to be chaired by CropIn's chief operating officer. The PSC will have a fiduciary responsibility including approval of AWPBs and scrutiny of any adjustments requested and material unauthorized expenditure overruns. Key audit findings from internal and external audits will be discussed in PSC meetings.

The SMARTFARM project will be piloted in KIIWP II in Rwanda and PASIDP II in Ethiopia. As CropIn will be the executing agency with MINAGRI (Rwanda) and MOA (Ethiopia) being partners in coordination and implementation of activities, no funds will be disbursed to the two projects. Consequently, financial

management requirements will all be undertaken by CropIn as the grant Recipient, whilst the partner entities in each country shall be responsible for providing any relevant information to CropIn in order for them to provide consolidated reporting to IFAD.

A separate finance unit will not be set up for the SMARTFARM project, CropIn will leverage its in-house team of experts in their Finance department for processing financial transactions, controls and administration of the funds.

Procurement

The procurement assessment revealed that Cropin will leverage the inhouse team of experts from procurement department for the procurement that may arise under the Grant. The Procurement team has adequate skills and capacity to undertake any procurement that may arise under the Grant. The procurement department is separate from the finance function.

Based on the procurement assessment and taking note that There is no procurement foreseen under the project, the procurement risk is rating is ?low?.

It is recommended to use CropIn?s procurement systems and procedures for the Grant to the extent that they are consistent with the IFAD Procurement Guidelines.

Planning and Communication

Planning - The main planning tools for the project will comprise the logical framework, monitoring and evaluation (M&E) framework including its indicators and targets and the Results Based Annual Work Plan and Budget (RB-AWPB). The Logframe will provide indicators and targets for project implementation from output to outcomes, development objectives to impact levels. The RB-AWPB will break physical targets up by year and attach financial resources to them. The RB-AWPB shall present financial and physical outputs and outcomes of the Programme for the given year, and report on the accumulative achievements. The execution of the RB- AWPB will be monitored along the M&E framework of the Programme and reported back in regular intervals from quarterly to semi-annuals reports. The cycle of planning, monitoring and reporting is essential for efficient management of the Programme and for achieving the results as agreed.

7. Consistency with National Priorities

Describe the consistency of the project with national strategies and plans or reports and assesments under relevant conventions from below:

NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, INDCs, etc.

- National Action Plan for Adaptation (NAPA) under LDCF/UNFCCC
- National Action Program (NAP) under UNCCD
- ASGM NAP (Artisanal and Small-scale Gold Mining) under Mercury
- Minamata Initial Assessment (MIA) under Minamata Convention
- National Biodiversity Strategies and Action Plan (NBSAP) under UNCBD
- National Communications (NC) under UNFCCC
- Technology Needs Assessment (TNA) under UNFCCC
- National Capacity Self-Assessment (NCSA) under UNCBD, UNFCCC, UNCCD
- National Implementation Plan (NIP) under POPs
- Poverty Reduction Strategy Paper (PRSP)
- National Portfolio Formulation Exercise (NPFE) under GEFSEC
- Biennial Update Report (BUR) under UNFCCC
- Others

The project is well aligned with the Paris Agreement's Global Goal on Adaptation including the following specific elements:

- Increase international focus on and efforts on adaptation.
- Recognition of need for metrics and assessment tools.
- Capacity-building and support for National Adaptation Plans; and
- Increased adaptation finance from developed countries for vulnerable developing countries.
- Implementation of the Paris Agreement and country level will be incorporated in this programme and project activities.

The project helps to address the *Paris Agreement's Global Goal on Adaptation* by (i) supporting the development of climate intelligence tools for climate risk assessment, (ii) developing metrics to assess the impacts of climate adaptation and resilience investments and measures, (iii) providing technical assistance for technology transfer of climate adaptation and resilience solutions and capacity building in developing countries. This project is consistent with and promotes *the goals of the UNFCCC and the UNCBD* and particularly the pursuit of adaptation and resilience to climate change in developing countries. In addition, this project is consistent with and supports the *Sustainable Development Goals* (Goals 1, 2, 3, 5, 8, 9, 12, 13 and 17). It also supports the Copenhagen and Durban climate finance targets of mobilizing USD 100 billion per year by 2020 for mitigation and adaptation in developing countries.

The project is also aligned and contributes to the Ethiopian Ten-Year Development Plan (2021-2030); Agriculture Sector Ten-Year Plan (2021-2030); Climate Resilient Green Economy (CRGE) and the associated Climate Resilience Strategy and Climate Smart Agriculture (CSA) strategy, 2020. Similarly, for Rwanda the SMARTFARM project contributes to National Agriculture Policy (NAP) of Rwanda and Strategic Plan for Agriculture Transformation phase 4 (PSTA 4) which aims at ensuring better weather and climate information and early warning, and climate smart technologies to enhance resilience and increase production.

The project also supports *GEF goals on adaptation and mitigation*. This project is consistent with *GEF's objectives supporting private sector engagement* for climate change adaptation, and specifically its desire to support *enhanced climate risk assessment tools that can be used by private sector investors and insurance companies; supporting technologies and business models for adoption of climate/weather services and drought tolerant techniques and crops, for example, which can build capacity for smallholders to adopt Climate Smart Agriculture techniques and expanding insurance access for countries vulnerable to climate change, such as Small Island Developing States and least developed countries.* Each component of the project, including operationalization, resource mobilization and legal setup will lead to increased investment in climate resilience and adaptation. The project is consistent with the national strategies of the countries where it will be implemented, and in particular with the NDC and NAPs

Ethiopia NAP, NDC key alignment aspects:

The National Adaptation Plan[1]

With its CRGE strategy and GTP II, Ethiopia aims to achieve middle-income status by 2025 while developing a green (low emissions) economy. GTP-II argues that reaching its goals require significant investments to boost agricultural productivity, strengthen the industrial base and foster export-oriented growth. However, Ethiopia - as a country and its people - has been the subject of costly natural disasters in its long history. Droughts, floods, human and livestock diseases, crop diseases and pests, hailstorms and wildfires (specific to some regions) are the major climate-related hazards in the country, affecting the livelihoods of significant numbers of people.

The NAP for Ethiopia aims to proactively and iteratively pursue further integration of climate change adaptation in development policies and strategies, including macroeconomic and sectoral policies and strategies at the national level, as well as Regional and Woreda plans and strategies. To achieve this, five

strategic priorities have been identified as below and the SMART FARM project can support priorities 1 and 2 of the NAP.

- ? Mainstreaming climate change adaptation into development policies, plans and strategies
- ? Building long-term capacities of institutional structures involved in NAP-ETH
- ? Implementing effective and sustainable funding mechanisms
- ? Advancing adaptation research and development in the area of climate change adaptation
- ? Improving the knowledge management system for NAP-ETH

The Nationally Determined Contributions[2]

Ethiopia's long-term goal is to ensure that adaptation to climate change is fully mainstreamed into development activities. This will reduce vulnerability and contribute to an economic growth path that is resilient to climate change and extreme weather events. Sectors included are Agriculture (livestock and soil), Forestry, Transport, Electric Power, Industry (including mining) and Buildings (including Waste and Green Cities). In line with these Ethiopia aims to improve crop and livestock production practices for greater food security and higher farmer incomes while reducing emission. As a medium term, the long-term adaptation goal, is to increase resilience and reduce vulnerability of livelihoods and landscapes in three pillars; drought, floods and other cross-cutting interventions. Particularly the measures proposed for droughts include improve traditional methods, productivity etc.; for floods enhancing the adaptive capacity of ecosystems, communities and; for other cross cutting the plan is to use effective early warning systems and disaster risk management policies to improve resilience to extreme weather events. SMARTFARM project is aligned to these government policy priorities and will contribute to their implementation through its projects components

Rwanda NAP, NDC key alignment aspects:

The Nationally Determined Contributions[3] 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. Rwanda is increasingly experiencing the impacts of climate change. Rainfall has become increasingly intense, and the variability is predicted to increase by 5% to 10%, the country seeks to contribute to the goal of limiting temperature rise to 2°C with efforts to reach 1.5°C agreed under the Paris Agreement. The country adopted the Green Growth and Climate Resilience Strategy (GGCRS) setting out the country's actions and priorities on climate change relating to both mitigation and adaptation and to how these will be mainstreamed within economic planning. The GGCRS is also embedded in the recently developed National Strategy for transformation (NST) (2018 - 2024) in alignment with Rwanda's 7-year Government Program. Under adaptation, for agriculture Rwanda aims to adopt:

Develop climate resilient crops and promote climate resilient livestock; Develop climate resilient post harvest and value addition facilities; and technologies; Strengthen crop management practices; Develop sustainable land use management practices; Expand irrigation and improve water management; and Expand crop and livestock insurance. These activities are well aligned to the SMARTFARM Project.

National Adaptation Plan[4] for Rwanda aims to adopt an integrated approach to adaptation to promote climate-resilient national, social and economic development with an emphasis on community- and ecosystem-based adaptation initiatives and building capacity of the government to advance the NAP process. The NAP for Action of NAPA for Rwanda had determined 6 priority action areas for adaptation to climate change which include: Integrated water resources management; Set up information systems of hydro agrometeorological early warning system and rapid intervention; Promotion of income generating activities; Promotion of income generating activities; Introduction of varieties resisting to environmental conditions; and Development of energy sources alternative to firewood.

[1] <https://www4.unfccc.int/sites/NAPC/Documents/Parties/NAP-ETH%20FINAL%20VERSION%20%20Mar%202019.pdf>

[2] <https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Ethiopia%20First/INDC-Ethiopia-100615.pdf>

[3] https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Rwanda%20First/Rwanda_Updated_NDC_May_2020.pdf

[4] <https://unfccc.int/resource/docs/napa/rwa01e.pdf>

8. Knowledge Management

Elaborate the "Knowledge Management Approach" for the project, including a budget, key deliverables and a timeline, and explain how it will contribute to the project's overall impact.

1. **Knowledge Management and Communication ?** The project KM strategy will be aligned to the already existing KM strategies for the IFAD Projects in both countries. The project will document success

stories and short documentary as part of the KM strategy. Regarding the communication strategy, the objectives of communication and visibility strategy will be to ensure project ownership by all stakeholders. Through communication activities, the project will disseminate information regarding the project and its results among project beneficiaries, stakeholders, development partners and a wider audience, thereby increasing impact and visibility for the project itself, GEF as the donor agency and IFAD as the lead implementing agency.

2. Introducing and implementing innovative technology also has risks and it is therefore required to have a robust Monitoring and Evaluation (M&E) strategy implemented throughout the project. At different key moments throughout the project, lessons learned will be shared and strategies will be adopted to cope with the issues involved.

3. The approach for evaluating and updating learning objectives and the development itself will use the 'agility cycle', as shown in Figure below. This allows for regular adjustments to the design and project implementation depending on the knowledge gained during the previous cycle. This is an effective and flexible method to generate new knowledge and integrate it in the development of the innovation.

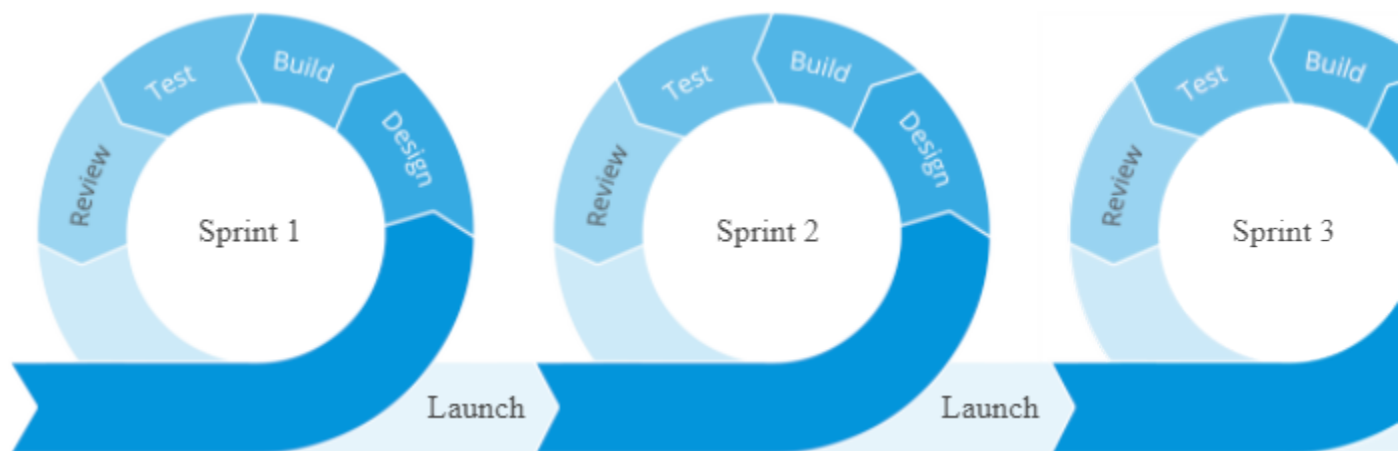


Figure : The agility cycle for knowledge management and development.

4. Knowledge management is a key pillar of the project to ensure future design and implementation. The learning system will capture and document lessons and innovations through ongoing data collection, monthly/semi-annual reports and thematic studies will be an integral part of the project learning and knowledge management. A lot of emphasis will be put on capturing accurate data for making real actionable plans.

5. Knowledge management teams (KMT) will be setup in both Rwanda and Ethiopia comprising of Knowledge Management expert, Data scientist/Technology Solution expert from CropIn (remotely), and Senior designer & ICT host drawing on staff and consultants working with the IFAD projects in Rwanda and Ethiopia, relevant ministries and CropIn. In The KMT will incorporate (i) Knowledge management action plan built around 3 action areas: knowledge generation, knowledge use and enabling environment and (ii) knowledge management result framework to be developed during implementation.

6. The project will develop a knowledge management platform to store, organize and manage knowledge products for their effective dissemination on the cases and evidence generated from component 1 and feedback from component 2.

7. The project would promote systematic and integrated management of data and results from two components to inform design and implementation of future interventions. Knowledge Products will build on the lessons from activities being undertaken under the grant.

8. The key deliverables include

- ? Promote the systematic and integrated management of project data and results to inform the new design and implementation of future interventions in country programmes;
- ? Increase the use of digital technology in M&E by: (i) increasing and improving the datasets currently used for these activities; (ii) expanding the tools to interrogate and disseminate that data (artificial intelligence and data science are fundamental in detecting trends and driving predictive analytics);
- ? Develop case studies, lessons learned, toolkits and templates related to the use of digital technology in project operations, and host them on repository along with external resources;
- ? Advancing knowledge and fill data gaps related to the use of ICT in agriculture and rural areas, including through the production of knowledge products;
- ? Organize knowledge-sharing events that foster peer-to-peer sharing of lessons learned from ICT4D projects;
- ? Promote a dedicated digital technology community of practice that includes GEF & IFAD headquarters, sub-regional hubs, centres of excellence for South-South and Triangular Cooperation and knowledge sharing, and external experts; and
- ? Build on the existing work of CropIn's knowledge bank and IFAD's Research and Impact Assessment Division to expand the use of ICT-based tools for M&E and impact assessment and develop a common toolset to capture baseline, midline, end-line and annual outcome data.

Knowledge products: Technical briefs, guides, how-to-do kits, videos, presentations, flyers, press releases, blogs, webinars, reports, case studies, etc.

9. **Knowledge development and dissemination:** The project will support the creation of replicable and scalable approaches to graduation and the development of innovative digital solutions. Disseminating reports and studies (in full or summarized) will enable information sharing and facilitate dialogue with stakeholders. The project will also have biannual and annual review meetings/workshops. Workshops will report on programme progress, lessons learned, challenges and solutions to implementation constraints.

10. The project will work closely with programme partners and the M&E function to capture lessons and impacts. The M&E knowledge management function will document and share knowledge through internal mechanisms (e.g. learning events, stakeholder workshop meetings, etc.) and externally (e.g. website, blogs, podcasts featuring programme stakeholders). In addition, the programme will publish a semi-annual programme update (online/print), along with good practices and human-interest stories. Knowledge activities will proactively pursue gender and youth issues and will report success stories related to the adoption of ICT solutions by member countries.

Type of Activity	Responsible	Budget US\$ (Excluding project staff's time)	Timeline
Formation of Knowledge Management team and KM plan	CropIn/IFAD/MoA/MINAGRI	NA	By August 2023
Documenting key lessons, success stories	CropIn team/IFAD projects/MoA/MINAGRI	4,536	2 per year and will be supplemented by project activities
Data recordation and analysis	CropIn	10,000	Each Season
Review and Feedback to design process	CropIn team/IFAD projects/MoA/MINAGRI	NA	Quarterly
Setting up a web platform for KM	CropIn	10,000	By Dec, 2023
Total		29,536	

9. Monitoring and Evaluation

Describe the budgeted M and E plan

1. **Monitoring and Evaluation and Learning ?** The project monitoring and evaluation will be compatible with the IFAD and GEF policies and guidelines. M&E will be guided by the project's logical framework and the M&E unit will systematically record data and performance information during project implementation. The M&E processes will build on the experience of the existing systems for IFAD Projects in Ethiopia and Rwanda to enhance the capacity of the system to generate data to inform management decision making. The project will dedicate funds from the project management cost towards M&E and reporting. This will be supplemented by regular supervision from project staff and IFAD.

Type of Monitoring & Evaluation activity	Responsible	Budget US\$ (Excluding project staff's time)	Frequency
Project Implementation Reports	MoA/MINAGRI/IFAD/CropIn	N/A	Annual
Quarterly Progress Review/Meetings	CropIn/IFAD projects/MoA/MINAGRI	10,000	Quarterly. Covered under component 2.2

Mid-Term Review	MoA/MINAGRI/IFAD/CropIn	NA	Not required for MSPs.
Terminal Evaluation	MoA/MINAGRI/IFAD/CropIn	25,000	Once at the end of the project
Steering Committee Meetings	MoA/MINAGRI/IFAD/CropIn	NA	Every year, after reception of the annual progress report
Total Indicative Costs		35,000	

10. Benefits

Describe the socioeconomic benefits to be delivered by the project at the national and local levels, as appropriate. How do these benefits translate in supporting the achievement of global environment benefits (GEF Trust Fund) or adaptation benefits (LDCF/SCCF)?

1. **Economic sustainability of the technology** - The implementation of SMARTFARM technology and engagement of the private sector actors is expected to create visibility of the agri-value chains which will potentially lead to risk mitigation and strengthening of agri-value chains that could contribute to increased investments by agro-processing companies, input suppliers, financial institutions, telecom companies, and development agencies working with the large networks of smallholder farmers under the platform. With these arrangements it would be possible to ensure economic sustainability of the platform through adoption of a user subscription model supported by the value added services provided by the technology.
2. SMARTFARM intends to support 200,000 smallholder farmers by increasing their potential economic capacity through maximizing farm productivity and quality with a suite of weather and crop and farm advisory services. The full value will be realized gradually once farmers start adopting these data driven practices and decision making over a period of time. It is anticipated that as farm data would build up and benefits start getting released, there would be an uptake from the farmers to invest more and reap higher benefits through better seeds, crop management practices, chemicals etc. The will therefore support such needs by bringing financial institutions as well as off-takers of the selected commodity value chains on the shared digital platform so that the collective risk can be reduced for the stakeholders. Technology will play a key enabler in terms of data interoperability, building economic and financial profiles based on historical, present and future agriculture performance.
3. In Ethiopia, the sustainability model will entail working with farmers organized around producers? co-operatives, with the co-operatives working under co-operative unions. In each woreda, SMARTFARM will work with two or three co-operatives organizations under PASIDP II and PACT. These organizations will then be linked to buyers and off-takers with support from the Federal Cooperative Agency (FDA), input suppliers and financial institutions. In Rwanda, the sustainability model with consist of working with farmers under the Farmer Field School (FFS) groups which will then be linked to the 50 co-operatives that had already signed an MoU with the KIIWP I & II Projects in Kayonza District. Through this arrangement the FFS groups and co-operatives will be supported with linkages with buyers, off-takers and financial institutions with assistance from the Rwanda Cooperative Agency (RCA).
4. Under SMARTFARM, farmer representatives from Farmer Clusters, FFS groups will be empowered to leverage digital platforms to digitize farm records and work as an institution to later benefit from collective trade. This would not only help maximize value and generate local employment but also reduce risk and build strong institutional capacity for stakeholders to further engage. It is anticipated that as a result of these benefits, the digital platform would generate generating social interest of smallholder farmers and other actors in both Ethiopia and Rwanda such as Government agencies and funding agencies such USAID, BMZ and IDH amongst others and these initiatives would create social sustainability.

11. Environmental and Social Safeguard (ESS) Risks

Provide information on the identified environmental and social risks and potential impacts associated with the project/program based on your organization's ESS systems and procedures

Overall Project/Program Risk Classification *

PIF	CEO Endorsement/Approval	MTR	TE
Medium/Moderate	High or Substantial		

Measures to address identified risks and impacts

Elaborate on the types and risk classifications/ratings of any identified environmental and social risks and impacts (considering the GEF ESS Minimum Standards) and any measures undertaken as well as planned management measures to address these risks during implementation.

1. Environmental and Social Risk Categories are determined by the nature and sensitivity of the project area, the significance and magnitude of potential impacts and the cumulative and induced impacts. The categorisation of the SMARTFARM Project is reviewed under IFAD's SECAP and the Ethiopian and Rwandan Environmental Assessment procedures. The interventions of the proposed project include the introduction of smart agricultural technologies, capacity building of identified/selected farmers and rural organizations and institutions/producer organizations and the creation of partnerships, knowledge and tools for promoting intra engagement of off-takers, buyers and institutions for credit and market linkage, and scaling up and replicating the model with member countries.

2. These interventions are expected to have only limited and site-specific environmental and social risks that can be readily remedied by appropriate preventive actions and/or mitigation measures. It is probable that a number of socio-economic issues related to the use of the smart agricultural technologies may have some implications on the livelihood of the targeted population that may not be readily remedied on time. These include lack of access of these technologies to women by the same pace it is done to men because of cultural dominance of men on women, resistance to use these technologies on the part of the targeted population and lack of skilled Human resource to operate the high-tech agricultural technologies. Taking into account these minor impacts the project is classified as **Category B** requiring the preparation of only Environmental Management Plan.

Climate Risk Classification

3. A new dimension of impacts, that may be qualified as 'externals' effects, impacts and risks need to be included in the ESIA analysis. These are climate change impacts. Traditionally, an ESIA would not look at effects, impacts and risks that are not inherent to the project itself (and directly caused by the project). Ignoring the external impacts and effects (caused by, for example, floods and droughts on the project and its goods, infrastructures, ecosystems and people) would greatly diminish the value of the ESIA instrument.

4. Climate Risk classification Because of recent droughts and the vulnerability of the project areas in Ethiopia and Rwanda to extreme events, the climate risk classification is High. Among the climate science community there is consensus that future climate of Ethiopia and Rwanda will be substantially warmer by mid-century. Projections of precipitation in the project areas of Rwanda are more variable by mid-century. Hence, the proposed Project emphasis on risk management is likely to increase resilience and adaptive capacity of households, communities and ecosystems. The Project will promote adaptation and mitigation measures in terms of: (i) enhancement of agricultural productivity using climate smart agriculture practices; and (ii) promotion of appropriate and tested innovative and climate smart technologies. Climate risk of the proposed SMARTFARM Project is therefore classified as **high**.

Negative Impact and Proposed Mitigation Measures

5. SMARTFARM Project using smart agricultural technologies has the potential to increase efficiency of farming, improve quality, and lower costs. However, introduction of these smart agricultural technologies may also negatively impact the socio economic and biophysical environment. The following are some of the risks/impacts and proposed mitigation measures to minimize those risks and impacts.

Technology risks/Impacts

6. During the implementation of proposed project there could occur risk of farmers lacking the willingness to adopt new climate smart agricultural practices. These risks entail the advisories on digital technologies not working and not delivering the expected results or are not cost-effective. There is also the risk of poor Information and Communications Technology (ICT) infrastructure in rural areas and lack of understanding and knowledge of ICT in addition to lack of ICT security management and inaccurate or incomplete data.

7. **Mitigation(s)** To minimize impacts of these events robust weather casting, forecasting and prediction models in SMARTFARM should be incorporated at all the stages of project design and project implementation to provide advisory on weather and climate projections to enable decision making on farm. Capacity building of staff on weather information services, climate risks and adoption of climate information services and resilient agriculture practices by smallholder farmers is also needed. To enable mitigation of technology risks a review of technological architecture will be conducted and an integration with Databases in the Ministry of Agriculture of Ethiopia and Rwanda will need to be done. This process will also include proportionality and segregation of data that will be managed by Ministry of agriculture of the respective countries to mitigate data privacy issues. In

addition, it is also proposed that capacity building of staff on digital technologies will be carried out to raise awareness of cybersecurity and data protection issues and robust and accurate data collection through effective point of collection and with clear accountabilities.

Lack of Partnerships

8. This risk also entails lack of support from government and key stakeholders, lack of interest to invest in poor remote areas by private sector partners and lack of understanding of local context by digital technology developers.

9. **Mitigation (s)** This risk will be mitigated through raising awareness on the importance and urgency of digital technology stressing that digital technology is key for acceleration of agriculture outcomes, and for achieving the SDGs. Further, strong engagement with governments, international development institutions, private sector, IFIs and service providers will be critical. It will also be necessary to perform an inventory of applicable laws and technical standards on privacy protection and cyber security while also actively engaging with government and key stakeholders through capacity building and sharing digital technology success stories. It will be necessary to have very strict and clear rules about the terms of partnerships and the use of data and protection of the users.

Climate change and environmental risks

10. Future climate Projections for Rwanda and Ethiopia according to Climate Service Centre Germany (GERICS) report predict that for Rwanda temperatures are expected to rise with likelihood of heatwaves resulting in extreme drought, or other climatic extreme in the next century. However, precipitations are expected to increase in some locations and some areas are prone to cyclones, extreme flooding, events. The same predictions for Ethiopia with the exception of low precipitation for Ethiopia in the beginning of the century and gaining towards 2050. These predictions indicate possible coincidence with an additional occurrence of extreme rainfall and extreme events with flooding events expected to impact rivers and surface water runoff during the summer.

11. **Mitigation(s)** The impact of these events on the overall project can be mitigated by introducing robust weather forecasting and prediction models and introducing them incorporating them at all the stages of project design and project implementation to provide advisory on weather and climate projections to enable decision making on farm. There is also the need to build the capacity of staff on weather information services, climate risks and adoption of climate information services and resilient agriculture practices by smallholder farmers.

Environment, Social and Climate Impact

12. The Introduction of smart agricultural production may encourage agricultural expansion and may end up in the clearance of nearby forest areas and at the same time encourage to intensify the use of agrochemicals and pesticides and these activities may adversely affecting public health and safety and at the same time increase release of greenhouse gases and also cause loss of biodiversity

13. **Mitigations:** Avoid encroachment towards forest areas and use integrated pest management system and comply to SECAP and national law on environment

Resistance to the use of Smart agricultural Technology

14. The targeted population may not understand the importance of using smart agricultural technology and may show resistance to use them in the course of implementing the project.

15. **Mitigations:** The following measures should be implemented to minimize such impacts.

-Dialogue with stakeholders at different levels;

-Implementation of IFAD's Framework for Operational Feedback from Stakeholders

-Deployment of participatory tools in the preparation, implementation and monitoring;

-Undertake stakeholders' feedback sessions.

Vulnerability to climate change

16. Ethiopia is the most vulnerable country to the impact of climate change. The SMARTFARM Project areas in Ethiopia and Rwanda are one of the seriously affected areas due to Climate variabilities, in the form of flood and drought, have long been affecting crop, livestock and forestry productivity, infrastructures, livelihood, water availability.

17. **Mitigation(s):** Climate resilient infrastructure development, crop and livestock productivity enhancement through the application of climate smart agriculture such as conservation agriculture, watershed management activities, awareness and capacity development will enhance resilience of the community and ecosystem.

Fragility and Security

18. There could be difficulty in the implementation of application of smart agricultural technology due to civil war especially in Ethiopia and the potential to spread COVID-19 in some parts of the project areas of Ethiopia and Rwanda.

19. **Mitigations:** There is a hope that the current effort by African Union to mediate talks between the federal government of Ethiopia and TPLF to end civil war and also conduct awareness campaign in Ethiopia and Rwanda to minimize health impacts due to COVID-19.

Project vulnerability to environmental conditions

20. Land degradation is increasing at an alarming rate in the project area where smart agricultural technology is proposed to be Introduced.

21. **Mitigation(s):** Mitigation actions to minimize land degradation will be to implement smart agricultural technology that will minimize land degradation in the agricultural production system

Lack of Capacity to implement of ESMP

22. Project implementing institutions may not have the expertise to implement the ESMP prepared for the proposed project.

23. **Mitigation(s):** Capacity need assessment tailored to address capacity gaps to implement the environment management plan will need to be identified and training should be provided to fill these gaps.

Resource efficiency and pollution prevention

24. The proposed project may employ in-efficient agricultural technology that does not also conserve energy and efficiently use resources and may adversely affect the environment.

25. **Mitigation(s):** Climate smart agricultural technology that will improve resource use efficiency should be Introduced to minimize environmental degradation and also comply to SECAP and national law on pollution prevention and precautionary approaches.

Impact on Indigenous Peoples

26. The indigenous people, Pastoralist, vulnerable groups, and disadvantaged people may indiscriminately deny access to smart agricultural technologies.

27. **Mitigation(s):** The Proposed project should ensure adequate number of vulnerable and disadvantage people have access to the smart agricultural technology and FPIC and IPP may be applied Strictly following IFAD's guidelines on targeting the population of the project areas

Greenhouse gas emissions

28. The SMARTFARM Project is expected to encourage the use of chemical fertiliser and livestock fattening and these activities may cause release of small amounts of GHGs into the environment.

29. **Mitigation(s):** The SMARTFARM Project should focus on low emitting animals such as poultry, sheep and goats and also implement afforestation and agroforestry activities to sequester GHGs that will be release into the environment.

Vulnerability of target populations and ecosystems to climate variability

30. Target community and ecosystem of the project areas are vulnerable to the impact of climate variability such as drought and flood. In these areas there are high hazard risks such as flood, extreme weather, wildfire, pest outbreaks**Mitigation(s):**

31. SMARTFARM Project will promote climate smart agriculture technologies that will improve crop varieties and support financing of smallholder farmers for climate adaptation and mitigation.

Grievances from the Target Population

32. Target population may have grievances on the project implementation due to non-functional GRM system. In addition, competition between water users especially in times of scarcity has the potential to create conflicts between users during project implementation especially in the irrigated command areas. In addition, due to existence of landless rural population in both countries, there is potential for land use conflicts arising from land tenure issues in both irrigated and non-irrigated areas

33. **Mitigation(s):** To mitigate risks and to ensure transparency and fairness of project interventions, a Grievance Redress Management (GRM) system will be established and the project will ensure awareness and adherence to the GRM procedures. The project GRM system will be spearheaded by Grievance Resolution Committee (GRC) established in the project implementation areas to inform and coordinate the relevant stakeholders and to provide resources for resolution.

34. Lack of internet network in the rural areas

35. It will be difficult to successfully implement SMARTFARM Project. Smart farming requires an unlimited or continuous internet connection to Provide continuous service to the targeted population in rural areas. In places like Ethiopia and Rwanda where internet connections are slow it will be difficult to implement smart agricultural technologies.

36. **Mitigation(s):**The project should make every effort to ensure the availability of internet network in places where smart agricultural technologies are planned to be Introduced.

Lack of Technical Skill

37. SMARTFARM Project is expected to makes use of high techs that require technical skill and precision to make it a success. It requires an understanding of robotics and ICT. However, many farmers do not have those skills. This can be a discouraging factor hindering the participation of farmers and adopting these technologies.

38. **Mitigation(s):**To minimize this type risks, it is important to consult and involve the main target/user groups in the development of the technology implementation plan. Moreover, risk can also be mitigated through Identify pioneer farmers that are interested in adopting a new climate smart technology or set-up demo plots which will cause low risk for farmers. Awareness campaign, capacity building and training should also be provided to minimize climate risk of farmers and stakeholders not taking interest in the technology.

COVID -19 Pandemic

39. This risk includes revival in the countries of implementation that limits operational capacities to develop the project and COVID-19 induced shocks to agriculture incomes and resilience.

40. **Mitigation(s):**To mitigate the risk and impact of COVID-19 the project the project should ensure engagement of local agencies and partners to enable adequate implementation and monitoring. COVID

protocols should be respected during project implementation and support should be provided to communities through messaging on the pandemic during stakeholder engagement

Supporting Documents

Upload available ESS supporting documents.

Title	Module	Submitted
IFAD-GEF-SMARTFARM-SECAP ESC Screening	Project PIF ESS	

ANNEX A: PROJECT RESULTS FRAMEWORK (either copy and paste here the framework from the Agency document, or provide reference to the page in the project document where the framework could be found).

Results Hierarchy	Indicators									Means of Verification		
	Name of Indicator	Units	Base line	End Target	Year 1- July 2023 -Jun 2024		Year 2- Jul 2024 -Jun 2025		End of Project Cumulative/ End-line Survey results	Source	Frequency	Responsibility
					Target	Actual	Target	Actual				
Outreach	Total number of direct beneficiaries in Ethiopia	House holds		100,000	50,000		100,000			Project reports	Quarterly	PAS IDP II & PACT in Ethiopia & KII WP II in Rwanda
	Female	House holds	0	50,000	25,000		50,000				Quarterly	
	Male	House holds	0	50,000	25,500		50,000				Quarterly	
	Total number of direct beneficiaries in Rwanda	House holds	0	30,000	20,000		30,000			Project reports	Quarterly	
	Female	House holds	0	15,000	10,500		15,000				Quarterly	
	Male	House holds	0	15,000	10,500		15,000				Quarterly	

Results Hierarchy	Indicators									Means of Verification		
	Name of Indicator	Units	Base line	End Target	Year 1- July 2023 -Jun 2024		Year 2- Jul 2024 -Jun 2025		End of Project Cumulative/ End-line Survey results	Source	Frequency	Responsibility
					Target	Actual	Target	Actual				
Goal: Improve the incomes and climate resilience of smallholder farmers in Ethiopia and Rwanda	Proportion of farmers reporting improved incomes (%)	(%) of farmers	0	100 %	50%	0	75%			Project reports	Quarterly	PAS IDP II & PACT in Ethiopia & KII WP II in Rwanda
	Area of land under climate resilience increase by at least 50%	Land area	0		TBA		TBA			Project reports	Annually	PAS IDP II & PACT in Ethiopia & KII WP II in Rwanda

Results Hierarchy	Indicators									Means of Verification		
	Name of Indicator	Units	Base line	End Target	Year 1- July 2023 -Jun 2024		Year 2- Jul 2024 -Jun 2025		End of Project Cumulative/ End-line Survey results	Source	Frequency	Res p.
					Target	Actual	Target	Actual				
Project Development Objective: Increased productivity, food security and resilience to climate shocks for smallholder farmers in Ethiopia and Rwanda	Proportion of farmers reporting improved crop and livestock productivity	(%) of farmers	0	100%	50%	0	75%			Project reports	Quarterly	PAS IDP II & PACT in Ethiopia & KII WP II in Rwanda
	Proportion of households below poverty rate	(%) of farmers	97%		80%		80%			Baseline, End-Line, And Farmer Cooperatives Data	Project Start & Project End	PAS IDP II & PACT in Ethiopia & KII WP II in Rwanda

Results Hierarchy	Indicators									Means of Verification		
	Name of Indicator	Units	Base line	End Target	Year 1- July 2023 -Jun 2024		Year 2- Jul 2024 -Jun 2025		End of Project Cumulative/ End-line Survey results	Source	Frequency	Responsibility
					Target	Actual	Target	Actual				
	Percentage of farmers adopting CSA activities (%)	(%) of farmers	0	100 %	50%	0	75%			Project reports	Quarterly	PAS IDP II & PACT in Ethiopia & KII WP II in Rwanda
Outcome 1: Increased number of farmers adopting improved and sustainable agriculture	Number of farmers registered on the SMART FARM platform	Number of farmers	0	130,000	70,000		130,000			Project reports	Quarterly	PAS IDP II & PACT in Ethiopia & KII WP II in Rwanda

Results Hierarchy	Indicators									Means of Verification		
	Name of Indicator	Units	Base line	End Target	Year 1- July 2023 -Jun 2024		Year 2- Jul 2024 -Jun 2025		End of Project Cumulative/ End-line Survey results	Source	Frequency	Res p.
					Target	Actual	Target	Actual				
ral practices	Proportion of farmers registered on the SMART FARM maintaining a crop health scorecard (%)	(%) of farmers	0	10%	10%		10%			Project reports	Quarterly	PAS IDP II & PACT in Ethiopia & KII WP II in Rwanda
Outputs : 1.1 Farmers receiving e-extension services	Proportion of farmers receiving e-extension services - climate and weather alerts, soil and water management, pests and diseases alerts etc.	(%) of farmers	0	100%	50%		100%			Project reports	Quarterly	PAS IDP II & PACT in Ethiopia & KII WP II in Rwanda

Results Hierarchy	Indicators									Means of Verification		
	Name of Indicator	Units	Base line	End Target	Year 1- July 2023 -Jun 2024		Year 2- Jul 2024 -Jun 2025		End of Project Cumulative/ End-line Survey results	Source	Frequency	Res p.
					Target	Actual	Target	Actual				
Outputs : 1.2 Farmers adopt improved soil management practices and post-harvest management	Proportion of farmers adopting improved soil management and post-harvest management practices	(%) of farmers		100 %	50%		100 %			Project reports	Quarterly	PAS IDP II & PACT in Ethiopia & KII WP II in Rwanda
Outcome 2: Farmers improve crop and livestock productivity through reduction in pre-harvest and post-harvest losses	Proportion of farmers reporting reduction in pre-harvest and post-harvest losses	(%) of farmers	0	100 %	50%		100 %			Project reports	Quarterly	PAS IDP II & PACT in Ethiopia & KII WP II in Rwanda
Output 2.1: Farmers	Number of farmers	Number of	0	130,000	100,000		130,000			Project reports		PAS IDP II &

Results Hierarchy	Indicators									Means of Verification		
	Name of Indicator	Units	Base line	End Target	Year 1- July 2023 -Jun 2024		Year 2- Jul 2024 -Jun 2025		End of Project Cumulative/ End-line Survey results	Source	Frequency	Res p.
					Target	Actual	Target	Actual				
receive capacity building from lead farmers on improved agronomic practices	who receive capacity building from lead farmers on improved agronomic practices	farmers									Quarterly	PACT in Ethiopia & KII WP II in Rwanda
Output 2.2: Farmers receive last mile support from inputs suppliers and other service providers ((Subjected to successful fundraising for this component)	Proportion of farmers receiving and accessing inputs and others services from inputs suppliers and other service providers	(%) of farmers		100 %	50%		100 %			Project reports	Quarterly	PAS IDP II & PACT in Ethiopia & KII WP II in Rwanda
Outcome 3:	Proportion of	(%) of	0	100	50%		100			Project	Quar	PAS IDP

Results Hierarchy	Indicators									Means of Verification		
	Name of Indicator	Units	Baseline	End Target	Year 1- July 2023 -Jun 2024		Year 2- Jul 2024 -Jun 2025		End of Project Cumulative/ End-line Survey results	Source	Frequency	Responsible
					Target	Actual	Target	Actual				
Improved access to markets Subjected to successful fundraising for this component))	farmer groups linked to potential buyers on the SMART FARM platform	groups		%			%			reports	terly	II & PACT in Ethiopia & KII WP II in Rwanda
Output 3.1: Smallholder farmers are linked to agribusinesses and market players through the platform (Subjected to successful fundraising for this component)	Proportion of farmers reporting improved access to markets	(%) of farmers		100 %	50%		100 %			Project reports	Quarterly	PAS IDP II & PACT in Ethiopia & KII WP II in Rwanda

ANNEX B: RESPONSES TO PROJECT REVIEWS (from GEF Secretariat and GEF Agencies, and Responses to Comments from Council at work program inclusion and the Convention Secretariat and STAP at PIF).

	GEF comments	IFAD responses
<p>Part I ? Project Information</p> <p>Focal area elements</p> <p>1. Is the project/program aligned with the relevant GEF focal area elements in Table A, as defined by the GEF 7 Programming Directions?</p>	<p>14 April 2022</p> <p>YES</p>	<p>N/A</p>
<p>Indicative project/program description summary</p> <p>2. Are the components in Table B and as described in the PIF sound, appropriate, and sufficiently clear to achieve the project/program objectives and the core indicators?</p>	<p>14 April 2022</p> <p>Please address the following comments:</p> <p>1. As adaptation is the principal objective of the project, the Rio Marker should be 2 (principal), not 1 which indicates only significant rating. Please revise.</p> <p>2. The objective statement should be very concise. All the details of the projects can be in Table B or in the description of each components. Please revise the project objective section accordingly.</p> <p>3. The co-finance is very low and will not pass further screening for this project which has a direct private sector and public sector financial leverage potential. While it is good to note in-kind co-finance from IFAD, the Secretariat expects more tangible</p>	<p>1. Rio marker revised for 2 (principal).</p> <p>2. This has been updated in the revised PIF.</p> <p>3. The co-financing amount has been revised in the PIF as follows:</p>

	<p>co-financing from IFAD through its other digital agriculture initiatives and importantly from CROPIN which is making significant investments in this sector. The LDCF grant is to catalyze such investments instead of providing an additional grant to expand operations. We noted the potential of 8-9 m at CEO ER stage. However, at the PIF please provide an indicative conservative estimated co-financing.</p> <p>4. While we appreciate the link with IFAD country programs (component 1 and 2), we suggest not to target beneficiaries only linked with IFAD country programs. There may be other potential initiatives by other agencies in the two countries which could benefit from this initiative and vice versa. We suggest to remove specific reference to IFAD country program and keep it more broad and flexible.</p>	<p>IFAD has reviewed possible synergies with IFAD supported programmes in the 2 countries and can mobilise ~USD 2.4 million in co-financing resources as loan through the ongoing projects and in-kind through Project Management Staff time to support the Project implementation in its duration</p> <p>For CropIn: The digital platform cost per farmer per year is around \$12-15 for WACS and DDAS. It can cost up to \$20 per farmer per year to include pest and disease early warning systems as per some of the projects.</p> <p>CropIn is contributing \$5/farmer/year engagement cost as co-financing for WACS and DDAS which makes it a total of \$1M for technology (for 200,000 SHFs). This is again exclusive of the cost involved in the regular updating of the platform which is shared with all the clients. Secondly, in terms of human resource, CropIn is committing Project Director?s and other personnel costs including that of technology, data science, solution experts to the tune of \$250,000 as in-kind support for project duration.</p> <p>4. While, this has been updated in the PIF, synergies with ongoing programmes with ATA Ethiopia and African-wide collaboration with AGRA will be explored. Besides, the dev sector projects, CropIn has partnerships with enterprise sector - agribusinesses, input companies, FIs, etc. - that can be leveraged for the programme who come and participate with 200,000 smallholder farmers. This will be further detailed during Step 2 of the design. Its also important to indicate that IFAD support to the Project would need to show synergies with its current ongoing projects in the identified countries, while ensuring</p>
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		participation of other beneficiaries beyond IFAD projects.
	<p>GEFSEC 26th April 2022</p> <p>Many thanks for the responses. Comment cleared.</p>	N/A
<p>Co-financing</p> <p>3. Are the indicative expected amounts, sources and types of co-financing adequately documented and consistent with the requirements of the Co-Financing Policy and Guidelines, with a description on how the breakdown of co-financing was identified and meets the definition of investment mobilized?</p>	<p>14 April 2022</p> <p>Please see comments related to co-financing above.</p>	Same as above. Updated in the PIF.
	<p>GEFSEC 26th April 2022</p> <p>Comment cleared.</p>	N/A
	<p>GEFSEC 25 May 2022</p> <p>On the PMC Proportionality: there is not proportionality in the co-financing contribution to PMC. If the GEF contribution is kept at 5.8%, for a co-financing of \$3,650,000 the expected contribution to PMC must be around \$211,700 instead of nothing. As the costs associated with the project management have to be covered by the GEF portion and the co-financing portion allocated to the PMC, the GEF contribution and the co-financing contribution must be proportional.</p>	Addressed in revised PIF

	<p>which means that the GEF contribution to PMC might be decreased and the co-financing contribution to PMC might be increased to reach a similar level. Please amend either by increasing the co-financing portion and/or by reducing the GEF portion. A more definitive estimation of PMC will be presented and adjusted at CEO Endorsement stage.</p>	
<p>GEF Resource Availability</p> <p>4. Is the proposed GEF financing in Table D (including the Agency fee) in line with GEF policies and guidelines? Are they within the resources available from (mark all that apply):</p>	<p>14 April 2022</p> <p>YES</p>	N/A
The STAR allocation?	N/A	
The focal area allocation?	N/A	
The LDCF under the principle of equitable access	YES	
The SCCF (Adaptation or Technology Transfer)?	N/A	
Focal area set-aside?	N/A	
Impact Program Incentive?	N/A	
<p>Project Preparation Grant</p> <p>5. Is PPG requested in Table E within the allowable cap? Has an</p>	<p>14 April 2022</p> <p>YES</p>	

exception (e.g. for regional projects) been sufficiently substantiated? (not applicable to PFD)		
Core indicators 6. Are the identified core indicators in Table F calculated using the methodology included in the correspondent Guidelines? (GEF/C.54/11/Rev.01)	While climate information data is indeed important for the project, the central focus of the project is agriculture. The meta information therefore should be revised to reflect this. Climate services intended under this project is also targeted for agriculture purpose mainly. We suggest to consider agriculture as 60%, water management 10% and climate services as 30%.	Agreed and updated in the PIF.
	GEFSEC 26th April 2022 Thanks. Comment cleared.	N/A
Project/Program taxonomy 7. Is the project/ program properly tagged with the appropriate keywords as requested in Table G	14 April 2022 Please see comment related to Rio Marker under the first question.	Revised.
	GEFSEC 26th April 2022 Thanks. Comment cleared.	N/A
Part II ? Project Justification 1. Has the project/program described the global environmental /	14 April 2022 Yes. Very well articulated. Thank you.	N/A

adaptation problems, including the root causes and barriers that need to be addressed?		
2. Is the baseline scenario or any associated baseline projects appropriately described?	<p>14 April 2022</p> <p>Baseline scenario is fine at the PIF stage. However, while developing the full proposal, please identify additional baseline projects funded by LDCF, AF or GCF. There are ongoing LDCF projects in Ethiopia and Rwanda by UNDP which have climate resilient agriculture focus and can be complementary to this project. A note in the PIF indicating that such projects will be identified at CEO ER stage will be appreciated.</p>	Updated in the baseline scenario
	<p>GEFSEC 26th April 2022</p> <p>Thanks. Comment cleared.</p>	N/A
3. Does the proposed alternative scenario describe the expected outcomes and components of the project/program?	<p>14 April 2022</p> <p>The alternate scenario and the three components look fine. Please review the details as in some places "three countries" are mentioned instead of two.</p> <p>It is understood that the project will strengthen capacity of extension workers and farmer groups, create knowledge and capacity building materials and pilot the services with a set of 200,000 farmers in the two countries. While the approach overall looks comprehensive, please clarify how the project will enable farmers to benefit from the services after 12 months of initial service. Will the project develop a self sustaining</p>	<p>1. Updated throughout the PIF</p> <p>On point 2: Expanded on Page 22 of PIF document The programme intends to support 200,000 smallholder farmers by increasing their potential economic capacity through maximising farm productivity and quality with a suite of weather and crop and farm advisory services. The full value will be realised gradually once farmers start adopting these data driven practices and decision making over a period of time.</p> <p>As the farm data would build up and benefits start getting released, there would be an uptake from the farmers to invest more and reap higher benefits through better seeds , crop management practices , chemicals etc. The program therefore intends to support such needs and add value by bringing a financial institution as well as</p>

	<p>business model to ensure long term continued benefit to the SHFs?</p> <p>The support activities are linked with GEF and IFAD resources. We would like dedicated efforts and resources from CROPIN also which has been operating in this space for a number of years and would like to leverage their resources also to scale up benefits to vulnerable farmers. We see a short description of this in incremental reasoning section. We will appreciate a more detailed description of this for better understanding.</p>	<p>an offtaker of the selected commodity in the value chain on the shared digital platform so that the collective risk can be reduced for the stakeholders.</p> <p>Technology will play a key enabler in terms of data interoperability, building economic and financial profiles based on historical, present and future agriculture performance.</p> <p>It is important, as a first step in the programme, to build farmers and farm profiles by collecting, verifying and sanitising the data on CropIn's SMARTFARM platform to not only improve advisory services but later build a credible risk sharing models and credit scores for a small group of farmers that is useful for buyers, off-takers, insurance providers, FIs to interact and transact with the farmer/Farmer groups. The programme intends to experiment and build minimum viable products and services and bundle them together beyond the initial stated objective of providing climate and advisory services.</p> <p>The interaction can be further enabled through remote sensing based crop assessments, credit scores, and a strong offtaker insight platform to connect buyers to potential farmers/farmer groups.</p> <p>Community representatives from Farmer clusters / Collectives would be empowered to leverage digital platforms to digitize farm records and work as an institution to later benefit from collective trade. This would not only help maximize value and generate local employment but also reduce risk and build strong institutional capacity for stakeholders to further engage.</p> <p>In the later phase, the risk sharing and credit score models would reduce the cost of</p>
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	<p>operations which goes in a brick and mortar/traditional model of transaction with farmers or the aggregated farmers. It would eliminate the need for collaterals and criterias which FIs need to issue credit to farmers through accurate risk assessment and due diligence. Further, the presence of buyers in the triangular value chains would provide extra incentive and pull for FIs to lend to the farmers for varying needs besides farm-based loans.</p> <p>The model will be scaled and replicated to 200,000 SHFs, and other regions through IFAD and other agencies supported programmes in Africa and India.</p> <p>CropIn has already touched base with leading FIs, buyers, donors and academic institutions to participate in experimenting with building minimum viable products and services for the programme. These include the likes of Rabobank, Ecobank, Wageningen University & Research, GSMA, GIZ, USAID, IDH etc.</p> <p>3. Addressed in the co-financing table as below:</p> <p>IFAD has reviewed possible synergies with IFAD supported programmes in the 2 countries and can mobilise ~USD 2.4 million in co-financing resources as loan through the ongoing projects and in-kind through Project Management Staff time to support the Project implementation in its duration</p> <p>For CropIn: The digital platform cost per farmer per year is around \$12-15 for WACS and DDAS. It can cost up to \$20 per farmer per year to include pest and disease early warning systems as per some of the projects. CropIn is contributing \$5/farmer/year engagement cost as co-financing for WACS and DDAS which</p>
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		<p>makes it a total of \$1M for technology (for 200,000 SHFs). This is again exclusive of the cost involved in the regular updating of the platform which is shared with all the clients. Secondly, in terms of human resource, CropIn is committing Project Director?s and other personnel costs including that of technology, data science, solution experts to the tune of \$250,000 as in-kind support for project duration.</p>
	<p>GEFSEC 26th April 2022</p> <p>Thanks. Comment cleared.</p>	N/A
4. Is the project/program aligned with focal area and/or Impact Program strategies?	<p>14 April 2022</p> <p>YES</p>	N/A
5. Is the incremental / additional cost reasoning properly described as per the Guidelines provided in GEF/C.31/12?	<p>14 April 2022</p> <p>Please refer to the comment regarding sustainability beyond 12 months of services. Please elaborate this a bit more in the PIF.</p>	N/A
	<p>GEFSEC 26th April 2022</p> <p>Thanks. Comment cleared.</p>	N/A
6. Are the project?s/program?s indicative targeted contributions to global environmental benefits (measured through core indicators) reasonable	<p>14 April 2022</p> <p>YES</p>	

and achievable? Or for adaptation benefits?		
7. Is there potential for innovation, sustainability and scaling up in this project?	<p>14 April 2022</p> <p>Yes. The project is highly innovative and first of its kind in LDCs. We will appreciate a bit more elaboration on the sustainability aspects of the project and innovation in implementation/business models which can be suited to the country contexts. We noted the approach to explore funding from different investors, donors, etc. The project may also consider exploring opportunity to integrate this within publicly funded agriculture programs to mainstream this in agriculture policies and programs and also potentially leveraging public finance for some kind of PPP based model.</p>	Updated on Page 22 of the PIF document.
	<p>GEFSEC 26th April 2022</p> <p>Thanks. Comment cleared.</p>	N/A
<p>Project/Program Map and Coordinates</p> <p>Is there a preliminary geo-reference to the project?/s/program?s intended location?</p>	<p>14 April 2022</p> <p>YES</p>	N/A
<p>Stakeholders</p> <p>Does the PIF/PFD include indicative information on Stakeholders engagement to date? If not, is the justification provided appropriate? Does the PIF/PFD include</p>	<p>14 April 2022</p> <p>In the list of stakeholders, the project shouldn't limit engagement with climate teams of the respective governments only. Engagement with agriculture department and related agencies will be highly useful in success of the project.</p>	Updated accordingly. Oversight as ministries of agriculture nominated staff to be present at meetings and several of these were specialists on agriculture, climate aspects. Further engagement with other ministries and agencies will be done during stage 2 of the design.

information about the proposed means of future engagement?		
	<p>GEFSEC 26th April 2022</p> <p>Thanks. Comment cleared.</p>	N/A
<p>Gender Equality and Women's Empowerment</p> <p>Is the articulation of gender context and indicative information on the importance and need to promote gender equality and the empowerment of women, adequate?</p>	<p>14 April 2022</p> <p>We appreciate the indication of a detailed gender plan at CEO ER stage. However, at the PIF stage also we would like some more details of how gender equality and women empowerment will be supported through the project. For this, please provide a bit more context and more details of the proposed gender inclusion approach.</p>	Updated on page 27.
	<p>GEFSEC 26th April 2022</p> <p>The PIF word document attached is in track changes mode and hard to read. Please upload a clean revised file.</p> <p>The elaboration of gender context is still inadequate and provides an outline only. Please provide some more context on gender related challenges and then map the interventions and approaches to respond to those challenges. Please elaborate a bit more.</p>	<p>A clean revised file will be uploaded.</p> <p>Gender section is updated to elaborate context of gender issues in smallholder agriculture and how SMARTFARM will empower female workers.</p>
	<p>GEFSEC 25 May 2022</p> <p>The project already identified that 50% of the beneficiaries are women given their role and contribution as smallholder farmers. Although the project has indicated that it will</p>	<p>Components' description have been adapted to reflect gender considerations. Moreover, a para on IFAD gender transformative mechanism for climate adaptation work in Ethiopia has been included, since the analysis and expertise will benefit also this project. More analysis and gender perspectives and considerations</p>

	<p>develop a gender mainstreaming plan during project preparation phase, it is recommended that gender perspectives should be reflected in each project component. This means, for example, ensuring that tools and technology, knowledge products developed, are gender-responsive (engaging gender experts) and that capacity-building activities planned must take into account gender considerations to maximize the contributions and engagement of women (and girls, as necessary), and the benefit of the project to them.</p>	will be fully taken into account during full design.
<p>Private Sector Engagement</p> <p>Is the case made for private sector engagement consistent with the proposed approach?</p>	<p>14 April 2022</p> <p>YES</p>	N/A
<p>Risks to Achieving Project Objectives</p> <p>Does the project/program consider potential major risks, including the consequences of climate change, that might prevent the project objectives from being achieved or may be resulting from project/program implementation, and propose measures that address these risks to be further developed during the project design?</p>	<p>14 April 2022</p> <p>In the risks, please include COVID-19 as one of the risks and suggest mitigation measures. In line with GEF's guidance related to COVID-19, please include a section describing COVID-19 risks, mitigation measures and the potential opportunities in the project to facilitate a green and resilient recovery.</p> <p>Further, as per GEF and STAP guidance, please elaborate climate change related risks to the project and how the project will tackle those risks.</p>	Updated in risks section- table.

	<p>GEFSEC 26 April 2022</p> <p>Thanks but still it's not adequate. We would like to see a more detailed analysis of COVID context in the target countries/regions, risks and mitigation strategies, and importantly, a clear articulation of how this project can support resilient recovery.</p> <p>Similarly, the climate risk assessment is also not adequate. Please explain a bit more on future climate scenarios, associated risks and how the project can tackle these risks. Please refer to STAP guidance for this or refer to other GEF IFAD projects in the GEF 7 period.</p>	<p>Updated risk table:</p> <p>Covid-19 section is added on new line to elaborate the context of the pandemic in the countries and address anticipated risks and mitigation measures.</p> <p>Climate risk includes the results from the climate risk screening tool (from IFAD) for both countries.</p> <p>Updated the Risk Table with Climate Projections</p>
	<p>GEFSEC May 6, 2021</p> <p>Thanks. The climate risk screening is fine. However, please articulate, how the project will support resilience recovery from the COVID-19 pandemic. This is required in addition to risk and mitigation measures, per GEF guidance.</p>	<p>The risks table has been updated related to how the project will support recovery related to the pandemic, mainly shock to incomes of smallholder farmers. Both technical and institutional capacity building and augmenting practical climate risk information available to farmers to support real-time changes in farming operations adjustments according to climate risks have been suggested. SMARTARM will introduce both weather nowcasting, forecasting and prediction models to deal with current and future risks. The capacity building, improved access and more efficient use of inputs will contribute to improved productivity and green recovery.</p>
<p>Coordination</p> <p>Is the institutional arrangement for project/program coordination including management, monitoring and evaluation outlined? Is there a description of possible coordination with relevant GEF-financed</p>	<p>14 April 2022</p> <p>In the project implementation and coordination arrangement, please specify how national/local government agencies or departments will be involved. Their engagement is important for greater buy-in, potential scale-up and tailoring the project activities in line with national climate</p>	<p>While SMARTFARM will leverage global satellite data through its existing partnership with IBM combined with onfarm data to provide climate and extension advisories, the project will also engage with other government agencies and partners as part of its implementation and sustainability of interventions particularly focusing on building local capacities and institutional strengthening for sustainability and scale-up. The detailed design will further elaborate on</p>

projects/programs and other bilateral/multilateral initiatives in the project/program area?	adaptation priorities of the two countries.	these aspects as part of project coordination model and capacity building.
	<p>GEFSEC 26 April 2022</p> <p>Thanks,. Comment cleared. We will look forward to clear articulation of government's engagement in the project at the CEO ER stage.</p>	N/A
<p>Consistency with National Priorities</p> <p>Has the project/program cited alignment with any of the recipient country's national strategies and plans or reports and assessments under relevant conventions?</p>	<p>14 April 2022</p> <p>Please provide more specific information regarding alignment with national priorities of the two countries Rwanda and Ethiopia. The section is quite generic.</p>	<p>Updated on page 34 and 35</p> <p>Updated on page 35</p>
	<p>GEFSEC 26 April 2022</p> <p>Thanks. Please upload a clean file, as the modifications are in track changes. Also, please add the list of national plans/policies in the portal entry. Alignment with GEF's goals isn't necessary in this section and can be moved to a different and more relevant section.</p>	<p>A clean revised file will be uploaded.</p> <p>Section is updated.</p> <p>Added National Policies.</p>
	<p>GEFSEC May 6, 2022</p> <p>Thanks. Comment cleared.</p>	
<p>Knowledge Management</p> <p>Is the proposed knowledge management</p>	<p>14 April 2022</p> <p>YES</p>	N/A

(KM) approach? in line with GEF requirements to foster learning and sharing from relevant projects/programs, initiatives and evaluations; and contribute to the project?s/program?s overall impact and sustainability?		
Environmental and Social Safeguard (ESS) Are environmental and social risks, impacts and management measures adequately documented at this stage and consistent with requirements set out in SD/PL/03?	14 April 2022 YES	N/A
	<p>GEFSEC 25 May 2022</p> <p>It is well noted that the project overall ESS risk is classified as moderate and PIF includes climate change and environment risks in the section 5. Risks to achieving Project Objectives. The Agency, however, should be able to attach a screening document (including type of environment and social risks for each MS 1-9) consulting with environmental and social specialists/unit of the Agency. Please provide an environmental and social risk screening document or plan for further environmental and social assessment and development of environmental and social management plan during PPG stage.</p>	A ESS screening was done and attached. We confirm we plan to conduct further ESS assessment and develop the ESMP during PPG stage.
Part III ? Country Endorsements	14 April 2022	Endorsement letter for Ethiopia uploaded in the portal.

Has the project/program been endorsed by the country's GEF Operational Focal Point and has the name and position been checked against the GEF data base?	No. Please attach the OFP endorsement letters from Ethiopia and Rwanda for this project.	Endorsement letter for Rwanda is pending from the OFP.
	<p>GEFSEC 26 April 2022</p> <p>Thanks for the letter from Ethiopia. Please secure letter from Rwanda also. Without the letter the PIF can't be cleared.</p>	The Letter of endorsement for Rwanda is coming
	<p>GEFSEC May 6, 2022</p> <p>Please resubmit the PIF with the LoE from Rwanda.</p>	The letter of Endorsement is uploaded in the portal
<p>Termsheet, reflow table and agency capacity in NGI Projects</p> <p>Does the project provide sufficient detail in Annex A (indicative termsheet) to take a decision on the following selection criteria: co-financing ratios, financial terms and conditions, and financial additionality? If not, please provide comments. Does the project provide a detailed reflow table in Annex B to assess the project capacity of generating reflows? If not, please provide comments. After reading the questionnaire in Annex C, is the Partner Agency eligible to administer concessional finance? If</p>	N/A	N/A

not, please provide comments.		
GEFSEC DECISION RECOMMENDATION Is the PIF/PFD recommended for technical clearance? Is the PPG (if requested) being recommended for clearance?	14 April 2022 Not yet. The Agency is requested to address the technical comments provided in the review sheet and resubmit the project for further review.	Addressed
	GEFSEC 26 April 2022 Not yet. Please resubmit the project by addressing additional comments.	
	GEFSEC April 26, 2022 Not yet. Please resubmit the project with an LoE from Rwanda and also by adding information on how the project will support green and resilient recovery from the impacts of COVID-19 pandemic.	LOE shared and green and resilient recovery impacts is covered in the risk mitigation table under COVID-19 impacts.
	GEFSEC 19 May, 2022 The LoE of Rwanda OFP has now been included. The project is recommended for technical clearance.	
	GEFSEC 25 May 2022 I	Addressed

	Please address three additional comments related to PMC proportionality, Gender and ESS provided under relevant questions in the review sheet.	
ADDITIONAL COMMENTS		
Additional recommendations to be considered by Agency at the time of CEO endorsement/approval.		

ANNEX C: Status of Utilization of Project Preparation Grant (PPG).
(Provide detailed funding amount of the PPG activities financing status in the table below:

PPG Grant Approved at PIF: 50,000			
<i>Project Preparation Activities Implemented</i>	<i>GETF/LDCF/SCCF Amount (\$)</i>		
	<i>Budgeted Amount</i>	<i>Amount Spent To date</i>	<i>Amount Committed</i>
Travel and Consultancies	50,000	30232.06	19,767.94
Total			

ANNEX D: Project Map(s) and Coordinates

Please attach the geographical location of the project area, if possible.



The designations employed and the presentation of the material in this map do not imply the expression of any opinion whatsoever on the part of IFAD concerning the delimitation of the frontiers or boundaries, or the authorities thereof.
 Map compiled by IFAD | 15-12-2022

Geographical area of intervention ? In Ethiopia, SMARTFARM will be implemented in four regions (Amhara, Oromia, Southern Nations, Nationalities Peoples Region ?SNNPR and Tigray) 110 Woredas

under PASIDP II, while under PACT the solution will be implemented in five regional states (Amhara, Oromia, SNNPR, Sidama and Somali) and 90 food insecure woredas as per programme design.

In Rwanda, SMARTFARM will be implemented in nine drought-prone Sectors of Kayonza District. Project sites will be selected based on the level of degradation, topography and water availability and viability of the site for development which is in conformity with the KIIWP I&II project design targeting strategy.

ANNEX E: Project Budget Table

Please attach a project budget table.

Appendix A: Indicative												
Expenditure Category	Detailed Description	Component definition	Component 1			Component 2		Component 3				
			Component (USDeq.)									
			Outcome 1: Increased number of farmers adopting improved and sustainable agricultural practices			Outcome 2: Improved crop & Livestock productivity through reduction in pre-harvest and post-harvest losses		Outcome 3: Improved access to markets				
			Output 1.1 : Farmers receiving e-extension services		Output 1.2 Farmers adopt improved soil management practices and post-harvest management	Output 2.1: Farmers receive capacity building from lead farmers on improved agronomic practices	Output 2.2: Farmers receive last mile support from inputs suppliers and other service providers	Output 3.1 Smallholder farmers are linked to agribusinesses and market players through the platform				
			Activity 1-Capture Baseline information of 200,000 SHFs with the help of 2000 village/agri entrepreneurs associated with IFAD Country programmes and support organizations on-boarded on SMARTFARM platform.	Activity 2 - Develop and deploy digital climate adaptation platformd for last mile delivery of services encompassing (a) weather and climate services (WACS), (b) data driven agriculture services (DDAS)	Activity 3- Provide 200,000 farmers access to climate smart production inputs and practices. The service offering extends for a period of one year to smallholder farmers.	Activity 4: Onboarding and training of 2,000 agri-extension workers/Lead farmers from IFAD country programmes with a target for 50% women participation to use and scale agri advisories to smallholder farmers		Activity 5. Knowledge Management	Activity 6: Partnerships established with private sector and market off takers for access to markets and financial services.	Activity 7: M&E	Sub-T	
I Country - Ethiopia												
A Digital Platform - SETUP and License												
Hosting and Infrastructure	Smartfarm Plus platform Hosting on AWS infrastructure with a client specific databse for the project			20 000								
Development of Reports and Dashboards	Requirement Analysis , Stakeholder discussion , Finalisation of format and development of reports and dashboards for respective stakeholders (in kind support)			10 000								
Integration to Government Database	Data integration from CroPln Cloud platform into local government database through rest based API's . Discussion to finalise the integration points and ensure push or pull /push integrations.		10 000									
License to users based on Scope	Smartfarm Plus License cost based on scope of the project (VBA's and Project team) and intelligence advisories (Crop stage, Crop Health, DEWS, Irrigation plans and Climate Smart for decision making support system			275 000								
B 3rd Party Services	Weather Data for Climate Smart Advisory				20 000							
	SMS Services from Department of Agriculture				15 000							
C Implementation Support	In Country Whiteboarding workshop for program implementation and Scope finalisation							5 000				
D Trainings, Workshops, Meetings ,Knowledge Management Services (Training of extension officers mobilized from institutional partners)							65 000	10 698				
Final Evaluation										15 000		
E Travel and supervision			15 000									
Sub-total: Ethiopia			25 000	305 000	35 000	0	65 000	15 698	0	15 000	0	
II Country - Rwanda												
A Digital Platform - SETUP and License												
Hosting and Infrastructure	Smartfarm Plus platform Hosting on AWS infrastructure with a client specific databse for the project			10 000								
Configuration and Setup	Configuration and Setup of the platform to provide access to Project Partners (Cooperatives , PACT/PACIDEF TEam , IFAD , ATI and Department of Extension) - Logins and mapping to be done in hierarchy of reporting and access rights based on that			5 000								

ANNEX F: (For NGI only) Termsheet

Instructions. Please submit an finalized termsheet in this section. The NGI Program Call for Proposals provided a template in Annex A of the Call for Proposals that can be used by the Agency. Agencies can use their own termsheets but must add sections on Currency Risk, Co-financing Ratio and Financial Additionality as defined in the template provided in Annex A of the Call for proposals. Termsheets submitted at CEO endorsement stage should include final terms and conditions of the financing.

ANNEX G: (For NGI only) Reflows

Instructions. Please submit a reflows table as provided in Annex B of the NGI Program Call for Proposals and the Trustee excel sheet for reflows (as provided by the Secretariat or the Trustee) in the Document Section of the CEO endorsement. The Agency is required to quantify any expected financial return/gains/interests earned on non-grant instruments that will be transferred to the GEF Trust Fund as noted in the Guidelines on the Project and Program Cycle Policy. Partner Agencies will be required to comply with the reflows procedures established in their respective Financial Procedures Agreement with the GEF Trustee. Agencies are welcomed to provide assumptions that explain expected financial reflow schedules.

ANNEX H: (For NGI only) Agency Capacity to generate reflows

Instructions. The GEF Agency submitting the CEO endorsement request is required to respond to any questions raised as part of the PIF review process that required clarifications on the Agency Capacity to manage reflows. This Annex seeks to demonstrate Agencies' capacity and eligibility to administer NGI resources as established in the Guidelines on the Project and Program Cycle Policy, GEF/C.52/Inf.06/Rev.01, June 9, 2017 (Annex 5).