A. LOGICAL FRAMEWORK

*This section refers to the project/programme's logical framework in accordance with the **GCF's Integrated Results Management Framework** to which the project/programme contributes as a whole, including in respect of any co-financing.*

E.1. Project/Programme Focus

Please indicate whether this proposal is for a mitigation or adaptation project/programme. For cross-cutting proposals, select both.

☐ Reduced emissions (mitigation)

☒ Increased resilience (adaptation)

E.2. GCF Impact level: Paradigm shift potential (max 600 words, approximately 1-2 pages)

This section of the logical framework is meant to help a project/programme monitor and assess how it contributes to the paradigm shift described in section D.2 above by applying three assessment dimensions - scale, replicability, and sustainability.

Accordingly, for each assessment dimension (see the definition per assessment in the accompanying guidance note), describe the current state (baseline) and the potential scenario (target) and rate the current state (baseline) by using the three-point-scale rating (low, medium, and high) provided in the guidance note. Also describe how the project/programme will contribute to that shift/ transformation under respective assessment dimensions (scale, replicability and sustainability). In doing so, please refer to section B.2(a) (theory of change).

Assessment Dimension	Current state (baseline)		Potential target scenario (Description)	How the project/programme will contribute (Description)
	Description	Rating		
Scale	Malagasy agriculture is characterized by the predominance of subsistence farming with low productivity per hectare, correlated with low levels of producer access to services and poor soil fertility, rural insecurity, overexploitation of natural resources, vulnerability to natural disasters (cyclones, drought and floods) and limited access to economic and commercial markets due to isolation, deteriorating infrastructure and difficulties in accessing agricultural markets and rural finance. All this against a context of almost generalized land and public insecurity. The country ranks fourth among those most affected by chronic malnutrition (47.3%). The DEFIS program capitalizes on and scales up experiences tried and tested by other IFAD and other projects and programs to transform agriculture into a more productive, sustainable and market-oriented sector: promotion of climate-smart agriculture, mobilization of surface water resources promotion of intensive or improved rice-growing systems (SRI/SRA), upgrading of irrigation	Medium	DEFIS+ will scale up successful results from IFAD projects (AD2M, FORMAPROD, AROPA, DEFIS, and PROSPERER and transform the climate vulnerable, and unsustainable subsistence (mostly slash-and-burn) rainfed agricultural sector to a climate-resilient, market-oriented and profitable economic sector. The scale of IFAD productive investments for sustainable agricultural development and the focus on building local capacities constitute a major paradigm shift in southern Madagascar renowned for humanitarian and emergency assistance. Thus, the project will scale up well-tested approaches and technologies building on innovative approaches and lessons learnt from previous IFAD investments.	• Rural development policies and strategies are formulated, implemented, and monitored at both national and regional levels. • Institutional and organisational capacities are strengthened in terms of sector coordination and monitoring of strategies for promoting priority climate and agricultural sectors and the delivery of services to farmers. • Contractual relations between agricultural market players are strengthened. • The project will contribute to this agricultural transformation by enhancing conditions that support climate, environmental and social goals (e.g., improving climate resilience, land health and production through the adoption of sustainable practices promoted by training and facilitated by access to financial products).

	infrastructure to cope with reduced runoff in dry periods: to connect them (i) to support services for production and markets, irrigation and water control infrastructure; (ii) to agricultural advice; and (iii) to technical itineraries and improved technologies adapted to climate change.			
Replicability	Agriculture in Madagascar is not presently resilient to climate change. Existing and pipeline programmes/projects on agriculture and rural development address Climate Change. Many good practices on climate change resilient and replicable agricultural techniques are already in place and replicable across DEFIS+ zones and respond to the country's national adaptation plan and agricultural sector strategies.	<u>High</u>	The DEFIS+ project activities are applied by IFAD to other geographic areas in Madagascar and in other countries. The project results in a new, replicable, long-term and sustainable funding model in other landscapes that enhances climate resilience, improves conservation, reduces land degradation and boosts economic development. Outside Madagascar, the proposed model of a land use transition investment fund is well suited for the most vulnerable countries, where unsustainable agriculture takes up an increasing share of available land, resulting in deforestation, land degradation and an agricultural sector not resilient to climate change. The Investment Fund is replicated in other least developed countries in Africa that need large-scale climate investments in rural areas to finance the activities necessary to achieve the objectives set in their NDCs and in their national adaptation programs.	● A long-term financing model is in place which enhances climate resilience and boosts economic development. ● A land use transition investment fund is established.
Sustainability	The existence of numerous strategic framework documents conducive to the implementation of actions to combat climate change. Existence of a national action plan to combat climate change and a national strategy for the agricultural sector to combat climate change, but a low percentage of funds allocated to the agricultural sector. Little effective application of existing regulatory texts. Infrastructure management structures exist but are not dynamic and functional.	<u>Medium</u>	Government institutions continue to maintain and build climate smart infrastructure. Local communities adopt climate smart practices and manage land and water resources sustainably. Farmers have continued access to markets and continuously increase their agricultural production. Agricultural development institutions take ownership of activities and ensure the sustainability of the investments from an institutional standpoint. DEFIS+ feeds into national policy dialogues and strategies, particularly those pertaining to climate change, to ensure that the project's	● The establishment of simple and efficient water harvesting systems that require minimal technical skills and that can be easily managed and maintained by beneficiaries beyond the project's lifetime. ● Beneficiaries adopt climate smart practices & efficient water use management. ● A maintenance programme for roads, storage and packaging infrastructures is established by the communities and financed through user contributions/ service payments and Regions budgets.

	Absence or weakness of technical agricultural advisory services. Limited use of technological innovations. Weak access to appropriate adaptation technologies and practices. Weak structuring of farmers and poor connection to production and market support services.		components are integrated into and can inform the country's legal and policy framework. Partnerships between producers and market organisations, as well as the inclusion of smallholder farmers in the formal economy will generate social and economic benefits that last well beyond the project's duration.	• Community members are trained in operation and maintenance of small-scale infrastructure. • Climate smart infrastructure and agricultural practices are integrated into the country's legal and policy framework. • Strengthened sustainable business relationships between farmers' organisations and market operators. • Households have diversified their sources of income. • Small-scale renewable and efficient energy options, such as biogas production units and solar dryers' technologies and improved cooking stoves (as alternative to firewood and charcoal) are adopted and continue to be built using local materials and local expertise.

E.3. GCF Outcome level: Reduced emissions and increased resilience (IRMF core indicators 1-4, quantitative indicators)

Select appropriate IRMF core and supplementary indicators to monitor project/programme progress. More than one IRMF (core and or supplementary) indicators may be selected as applicable for each GCF results area and project/programme outcome (as defined in the table in section B.2(b)). If IRMF indicators are unable to measure any given project/programme outcomes, project/programme-specific indicators should be developed under section E.5 (project/programme specific indicators).

GCF Result Area	IRMF Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions / Note
				Mid-term	Final[1]	
Total number of direct and indirect beneficiaries	Core 2: Direct and indirect beneficiaries reached	Mid-term and Final Evaluation Reports; District Development and Economic Reports	0	Direct: 178 881 (Male: 89 440; Female: 89 441) Indirect: 1 417 488 (Male: 708 744; Female: 708 744)	Direct: 447 201 (Male: 223 601 Female: 223 600) Indirect: 3 543 719 (Female: 1 771 859; 1 771 860)	As outlined in Annex 18, direct beneficiaries are those receiving direct interventions from the GCF funded project. The 447,201 beneficiaries will be benefitting from the following interventions: i.) The development of efficient water management systems; ii.) Regular access to reliable-climate data; iii.) Improved climate resilience of basic rural infrastructure; iv.) Training and capacity building services; vi.) Knowledge management on the adaptation of food

[1]The final target means the target at the end of project/programme implementation period. However, for core indicator 1 (GHG emission reduction), please also provide the target value at the end of the total lifespan period which is defined as the maximum number of years over which the impacts of the investment are expected to be effective.

						production systems to climate change and on carbon sequestration. Methodology: The project-level M&E Specialist will provide a registry for each DEFIS+ region to be filled in. The information will be consolidated and used to assess the level of achievement of the targets. These registers will be supplemented by surveys conducted every 2 years.
ARA1 Most vulnerable people and communities	Core 2: Direct and indirect beneficiaries reached	Mid-term and Final Evaluation Reports; District Development and Economic reports	0	Direct: 178 881 (Male: 89 440; Female: 89 441) Indirect: 1 417 488 (Male: 708 744; Female: 708 744)	Direct: 447 201 (Male: 223 601 Female: 223 600) Indirect: 3 543 719 (Female: 1 771 859; Male: 1 771 860)	Stable political and macro-economic environment
ARA2 Health, well-being, food and water security	Core 2: Direct and indirect beneficiaries reached	Mid-term and Final Evaluation Reports; Annual Progress Reports; External data will be collected from Governmental reports, surveys from research institutions, UN reports (FAO, UNICEF), etc.	0	Direct: 178 881 (Male: 89 440; Female: 89 441) Indirect: 1 417 488 (Male: 708 744; Female: 708 744)	Direct: 447 201 (Male: 223 601 Female: 223 600) Indirect: 3 543 719 (Female: 1 771 859; Male: 1 771 860)	Agro-forestry and watershed management activities are effectively implemented
ARA3 Infrastructure and built environment	Core 2: Direct and indirect beneficiaries reached	Mid-term and Final Evaluation Reports; District Development and Economic reports	0	Direct: 178 881 (Male: 89 440; Female: 89 441) Indirect: 1 417 488 (Male: 708	Direct: 447 201 (Male: 223 601 Female: 223 600) Indirect: 3 543 719 (Female: 1 771 859; Male: 1 771 860)	Farmers assisted with heavy rehabilitation works

				744; Female: 708 744)		
ARA 4: Ecosystems and ecosystem services	Core 2: Direct and indirect beneficiaries reached	Mid-term and Final Evaluation Reports; Annual Progress Reports; District Development and Economic reports	0	Direct: 178 881 (Male: 89 440; Female: 89 441) Indirect: 1 417 488 (Male: 708 744; Female: 708 744)	Direct: 447 201 (Male: 223 601 Female: 223 600) Indirect: 3 543 719 (Female: 1 771 859; Male: 1 771 860)	Adoption of climate resilience technologies.
ARA1 Most vulnerable people and communities	Supplementary 2.1: Beneficiaries (female/male) adopting improved and/or new climate-resilient livelihood options	Mid-term and Final Evaluation Reports; District Development and Economic reports	0	Direct: 178 881 (Male: 89 440; Female: 89 441) Indirect: 1 417 488 (Male: 708 744; Female: 708 744)	Direct: 447 201 (Male: 223 601 Female: 223 600) Indirect: 3 543 719 (Female: 1 771 859; Male: 1 771 860)	As outlined in annex 18, this includes the number of farmers trained in climate-resilient agricultural production technologies and practices and indicating that their knowledge of climate adaptive practices has increased (ARA1) Methodology: The project-level M&E Specialist will provide a registry for each DEFIS+ region to be filled in. The information will be consolidated and used to assess the level of achievement of the targets. These registers will be supplemented by surveys conducted every 2 years.
ARA2 Health, well-being, food and water security	Supplementary 2.3: Beneficiaries (female/male) with more climate-resilient water security	Mid-term and Final Evaluation Reports; District Development and Economic reports; UN water reports	0	Direct: 107 328 (Male: 53 664; Female: 53 664) Indirect: 850 493 (Male; 425 246 Female: 425 247)	Direct: 268 321 (Male: 134 160; Female: 134 161) Indirect: 2 126 231 (Male: 1 063 116; Female: 1 063 115)	As outlined in annex 18, this includes the number of farmers using renewable energy and energy efficient and water efficient technologies (ARA3) leading to improved and more reliable (year-round and year-to year) access to safe, sufficient, and affordable water to meet basic needs for

						drinking, sanitation and hygiene. Assumption: Water units owned by communities not HHs Methodology: The project-level M&E Specialist will provide a registry for each DEFIS+ region to be filled in. The information will be consolidated and used to assess the level of achievement of the targets. These registers will be supplemented by surveys conducted every 2 years.

ARA2 Health, well-being, food and water security	Supplementary 2.2: Beneficiaries (female/male) with improved food security	Mid- term and Final Evaluation Reports; District Development and Economic reports	0	Direct: 178 881 (Male: 89 440; Female: 89 441) Indirect: 1 417 488 (Male: 708 744; Female: 708 744)	Direct: 447 201 (Male: 223 601 Female: 223 600) Indirect: 3 543 719 (Female: 1 771 859; Male: 1 771 860)	As outlined in annex 18, this includes the number of farmers trained in climate-resilient agricultural production technologies and practices and indicating that their knowledge of climate adaptive practices has increased (ARA1) Assumption: Adoption of climate resilience technologies Methodology: The project-level M&E Specialist will provide a registry for each DEFIS+ region to be filled in. The information will be consolidated and used to assess the level of achievement of the targets. These registers will be supplemented by surveys conducted every 2 years
	Core 3: Value of physical assets made more resilient to the effects of	Annual Progress Reports; District Development and Economic reports;	0	USD 10 215 196	USD 18 573 066	Assumption: Farmers assisted with heavy rehabilitation works; Trainers,

ARA3 Infrastructure and built environment	climate change and/or more able to reduce GHG emissions	Registry; Survey (every 2 years)		8 500 ha of irrigated perimeter 300 km of roads rehabilitated	15 000 ha of irrigated perimeters 540 km of roads rehabilitated	actors and professionals will be trained on new standards (ARA3) Methodology: The project-level M&E Specialist will provide a registry for each DEFIS+ region to be filled in. The information will be consolidated and used to assess the level of achievement of the targets. These registers will be supplemented by surveys conducted every 2 years
ARA 4: Ecosystems and ecosystem services	Core 4: Hectares of natural resource areas brought under improved low emission and/or climate-resilient management practices	Mid-term and Final Evaluation Reports GIS	0	50% of restored ecosystems	100% of restored ecosystems	Adoption of climate change adaptation activities with mitigation co-benefits and restoration of 1,500 ha of forest ecosystems
ARA 4: Ecosystems and ecosystem services	4.1 Hectares of terrestrial forest, terrestrial non-forest, freshwater and coastal-marine areas brought under restoration and/or improved ecosystems (unit: hectares)	Annual Progress Reports; Mid- term and Final Evaluation Reports	0	6,000 ha Terrestrial forest: 2,100 ha Terrestrial non-forest: 3,900 ha	18,100 ha Terrestrial forest: 6,330 ha Terrestrial non-forest: 11,770 ha	Planned agro-forestry and watershed management activities are effectively implemented. Annex 18 also includes information on the number of farmers practicing agroforestry and adaptive practices (ARA4) Methodology: Information available in project implementation and supervision reports. These reports can be complemented with surveys and GIS mapping.

E.4. GCF Outcome level: Enabling environment (IRMF core indicators 5-8 as applicable)

Select at least two relevant IRMF core (enabling environment) indicators to monitor and elaborate the baseline context and project/programme's targeted outcome against the respective indicators. Rate the current state (baseline) vis-à-vis the target scenario and select the geographical scope of the outcome to be assessed. Describe how the project/programme will contribute towards the target scenario. Refer to a case example in the accompanying guidance to complete this section.

Core Indicator	Baseline context (description)	Rating for current state (baseline)	Target scenario (description)	How the project will contribute	Coverage
Core Indicator 6: Degree to which GCF investments contribute to technology deployment, dissemination, development or transfer and innovation	Low-performing subsistence farming systems. Malagasy farmers are particularly vulnerable to any shocks affecting the agricultural system owing to their high livelihood dependence on the agriculture sector, high occurrence of climate related disasters, limited climate resilience investments and capacity, and lack of access to formal safety nets.	low	Malagasy farmers are enabled & supported in the adoption of more efficient and sustainable agricultural practices (e.g. new technologies and access to financial products to afford them) allowing them to increase their climate resilience, production and incomes.	• Capacity building & trainings • Adoption of smart practices • Increased financial access • Increased access and use of climate information • Improved land and water management • Climate smart infrastructure	Multiple sub-national areas within a country
Core indicator 7: Degree to which GCF Investments contribute to market development/transformation at the sectoral, local, or national level	Farmers sell very little produce due to i.) low production levels; ii.) low access to markets due to poor roads and iii.) low bargaining power & informal relations with market players.	low	Malagasy farmers are able to produce enough to meet their own consumption needs and to sell produce in markets. Farmers have access to these markets and the ability to assure a fair price.	• Increased access to markets • Increased access to market information • Contractual relations between agricultural market players are strengthened.	Multiple sub-national areas within a country

E.5. Project/programme specific indicators (project outcomes and outputs)

*This section should list out project/programme-specific performance indicators (outcomes and outputs) that are not covered in sections above (E.1-E.4). List down tailored indicators to monitor /track progress against relevant project/programme results (outcomes/outputs). AEs have the freedom to decide against which outcomes they would like to set project/programme specific indicators. If any co-benefits are identified in sections B.2(a)(b), and D.3, AEs are encouraged to add and monitor co-benefit indicators under the "**Project/programme co-benefit indicators**" section in table below. Add rows as needed.*

Please number each outcome and output as shown below to indicate association of outputs to the contributing outcome. The numbering for outputs under this section should correspond to the output numbering in annex 4 (detailed budget plan).

Project/programme results (outcomes/ outputs)	Project/programme specific Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions / Note
				Mid-term	Final	

Outcome 1. Strengthened climate resilience of agricultural production systems	Average yields of agricultural production	Monitoring and Supervision Reports	0	15%	30%	Adoption and implication of beneficiaries; No major changes in the country's Agricultural Policy
Output 1.1. Improved water management for sustainable agriculture	Area of land with improved water management systems	Monitoring and Supervision Reports; District Development and Economic reports; Basin Management Regulations	7096 ha of land is irrigated in the intervention area by other projects and programmes	8 500 ha	15 000 ha	Adoption and implication of communes; No major changes in the country's Agricultural policy
	Protected areas through the implementation of anti-erosion measures, protection of watersheds and reforestation	Monitoring and Supervision Reports; District Development and Economic reports; Basin Management Regulations	0	5 000 ha	8 100 ha	Adaptation by farmers and implication of commune and region; Development plans at different levels put in place, equipped with the means to implement them, and benefiting from guaranteed land security
	Number of farmers engaged in the effective management of connects sub–watersheds and irrigated perimeters and adopting improved water management techniques	Monitoring and Supervision Reports; District Development and Economic reports	0	Direct: 107 328 (Male: 53 664; Female: 53 664) Indirect: 850 493 (Male; 425 246; Female: 425 247)	Direct: 268 321 (Male: 134 160; Female: 134 161) Indirect: 2 126 231 (Male: 1 063 116; Female: 1 063 115)	Engagement of farmers and incentives to adopt improved water management techniques
Output 1.2: Enhanced agro-climatic information systems, new technologies and initiatives	Number of farmers with access to agro-climate data	Monitoring and Supervision Reports; District Development and Economic reports; field surveys	0	Direct: 71 552 (Male: 35 776; Female: 35 776) Indirect: 566 995 (Male: 283 498; Female: 283 497)	Direct: 178 881 (Male: 89 440; Female: 89 441) Indirect: 1 417 488 (Male: 708 744; Female: 708 744)	Engagement of DGM, SRM and DRAEP
	Number of farmers reporting the adoption of new/improved technologies, practices or inputs	Monitoring and supervision reports; District Development and Economic reports; Field surveys	0	Direct: 107 328 (Male: 53 664; Female: 53 664) Indirect: 850 493 (Male: 425 246;	Direct: 268 321 (Male: 134 160; Female: 134 161) Indirect: 2 126 231 (Male: 1 063 116;	Interests/incentives of the actors is maintained

				Female: 425 247)	Female: 1 063 115)	
Outcome 2: Increased income generation through improved market accessibility	Average annual farm income per household	Monitoring and supervision reports; Household survey	838 100 ariary	4 000 000 ariary	4 500 000 ariary	Increase in the number of productions placed on the market and development of long-term relationships with market operators
Output 2.1. Reinforced rural access roads	Kilometres of unpaved rural access roads in good condition all year	Monitoring and Supervision Reports; District Development and Economic reports	0	300 km (USD 27 million)	540 km (USD 48.6 million)	Adoption and implication of communes
	% of ground water recharge at specific sites along the greened road	Monitoring and recording of hydrological data	0-1% (average)[2]	Increase in ground water recharge by at least 2.5% at specific sites	Increase in ground water recharge by 5% at specific sites[3]	Farm ponds and check dams are constructed, and community support ensures their sustainability and care
Output 2.2. Improved capacity to build and maintain rural infrastructure	Number of trainers, actors and professionals trained on new standards and whose maintenance capacity has improved as a result	Monitoring and Supervision Reports; Field Surveys; Training Reports; Follow up tests on trainings	0	Direct: 71 552 (Male: 35 776; Female: 35 776) Indirect: 850 493 (Male: 425 246; Female:425 247)	Direct: 178 881 (Male: 89 440; Female: 89 441) Indirect: 1 417 488 (Male708 744; Female: 708 744)	Adoption and implication of the actors ; The control and validation bodies remain operational
Outcome 3: Improved food and nutrition security	Households receiving targeted support to improve their nutrition	Monitoring and Supervision Reports; Field Surveys; Training Reports;	0	100 000	270 000	Adoption of good nutrition practices
Output 3.1 Knowledge on climate change and food security generated and shared	Number of studies carried out; Number of knowledge products produced; Number of awareness events; Number of exchange visits	Capitalization reports; Baseline study; Mid-term study	0	8 studies 10 thematic knowledge products 5 awareness events 15 exchange visits	20 studies 20 thematic knowledge products 10 awareness events 30 exchange visits	Expertise is available at the different levels
	Number of farmers trained in climate-resilient agricultural production technologies and	Monitoring Reports and Surveys; District Development and Economic	0	Direct: 178 881 (Male: 89 440; Female: 89 441)	Direct: 447 201 (Male: 223 601 Female: 223 600)	Expertise is available at different levels

[2]The amount of ground water recharge is influenced by various factors which include topography, land use, land cover, among others.
[3]This estimation is based on the globally estimated average annual recharge rates for semi-arid and arid regions (see Hoori Ajami, Groundwater Recharge *in* Encyclopedia of Geology (Second Edition), 2021)

	practices and indicating that their knowledge of climate adaptive practices has increased	reports; Follow up tests on trainings		Indirect: 1 417 488 (Male: 708 744; Female: 708 744)	Indirect: 3 543 719 (Female: 1 771 859; 1 771 860)	
Project/programme co-benefit indicators						
Improved health	Percentage of women of reproductive age in the targeted areas reporting a minimum dietary diversity (measured with the MDD-W indicator: Minimum-Dietary Diversity-Women)	DEFIS baseline, mid-term and end-line survey	7,1% of women have attained the MDD in the project area	50%	70%	Adoption of climate-resilient practices, improved incomes, and adoption of nutrition practices. No major event that affects food availability
Improved WASH	Number of people reporting improved access to basic sanitation	Government reports, UN agency reports (UNICEF, UNWATER, etc),	10% of the population have access to basic sanitation.	Linked to beneficiaries of Output 1.1. Direct: 107 328 (Male: 53 664; Female: 53 664) Indirect: 850 493 (Male; 425 246; Female: 425 247)	Linked to beneficiaries of Output 1.1 Direct: 268 321 (Male: 134 160; Female: 134 161) Indirect: 2 126 231 (Male: 1 063 116; Female: 1 063 115)	Improved water management lowers risk of water borne diseases and population is also facilitated in adopting improved sanitation practices
Improved climate change mitigation	GHG emissions reduced, avoided or removed/sequestered	EX-ACT analysis	0	- 836 334.5 tCO2-eq (considering implementation and capitalization phases as in EX-ACT) - 250 899 tCO2-eq (considering annual averages over 3 years)	- 1 672 669 tCO2-eq (considering implementation and capitalization phase as in EX-ACT) - 501 798 tCO2-eq (considering annual average over 6 years)	Co-benefit indicator related to GHG reductions/low emissions development pathways and sustainable development Adoption of climate change adaptation practices with mitigation co-benefits, improved carbon sink via reforestation, and restoration of 1.500 ha of forest ecosystems The EX-ACT methodology V.9 will be the employed.

						Methodology: tCO2eq flows are calculated from land use changes (e.g., afforestation), cropland, grassland and livestock, forest management, inputs, and investments. The EX-ACT tool calculates total t CO2eq avoided or sequestered over the total lifespan of the project. Please refer to Annex 17 for further details.

E.6. Project/programme activities and deliverables

All project activities should be listed here with a description and sub-activities. Significant deliverables should be reflected in annex 5 implementation timetable. Add rows as needed.

Please number the activities as shown below to indicate association of activities to the related outputs provided above in section E.5. Similarly, please number sub-activities as shown below to associate to the related activity.

Activities	Description	Sub-activities	Deliverables
Activity 1.1.1. Protection of irrigation schemes against climate change impacts	Protection of irrigated schemes from the destructive impacts of violent rain and climate impacts	Improve drainage networks, irrigation channels, de-silting systems, water retention works, etc.	15 000 ha of irrigated schemes strengthened and improved
Activity 1.1.2. Sustainable sub-watersheds (adjacent to irrigated schemes) management and restoration of landscape	Biological and mechanical protection of sub-watersheds, soil management, water infiltration management Planting fast grown trees and species resilient to climate change	Plant rows of herbaceous plants or shrubs along curves; build benches, terraces and mechanisms to prevent gullies from forming Establishment of nurseries and production plants Implementation of reforestation activities	8 100 ha of land improved on water infiltration with anti-erosion systems of which 5 500 ha of landscape restored and reforested 900 technicians are trained
Activity 1.1.3. Strengthening capacities of Water Users Associations to manage water and apply sustainable water management practices	Training on climate change adaptation, water resource preservation and management plans Organization of exchange visits between Water Users Association (WUA)	Information on and identification of leaders; organization of visits; facilitation of the evaluation of the visits' results	1 400 WUA members exchanging and learning good practises
Activity 1.1.4. Construction of climate smart water tanks for drip-irrigation and for small livestock	Build a surface water storage system to irrigate the terraces and reduce runoff	Identification of sites and user; technical feasibility study and construction. Training for farmers	150 water tanks in use
Activity 1.2.1. Installation of automated agro-meteorological stations and development of flood and drought monitoring and forecasting system	Acquisition and installation of automated agro-meteorological stations	Partnership with DGM; choice and acquisition of stations in collaboration with DGM; installation of the stations; training for technicians	6 automated agro-meteorological stations are operational

Activity 1.2.2. Capacity building of decentralised government (SRM & DRAEP)	Support for processing and distribution of agro-meteorological data	Partnership with SRM and DRAEP; elaboration of work plans; support for the execution of work plans, especially data distribution; monitoring of the quality of the data distribution system	24 DRAEP and SRM teams trained and involved in processing and disseminating agro meteorological data 178 881 farmers use agro meteorological information in the implementation of the cultural campaign
Activity 1.2.3 Promotion and dissemination of meteorological and climate smart agriculture practices	Area restored with the adoption of intelligent agriculture	Farmers practising Climate Smart Agriculture Practices	Adoption of intelligent agricultural on 10 000 ha
	New methods of integrated pest management disseminated	Training farmers on modern pest management control in the FFS	At least 3 new methods of integrated pest management techniques adapted to the context of FFS
	Quantity of additional seeds produced by the CPSA per year (tons)	Support the Agnarafaly Seed Production Center (CPSA) and Kianjavato Center in the multiplication and promotion of certified or quality declared seeds.	Several tons per year of certified or quality declared seeds
	Numbers of farmers benefiting from improved climate-resilient species and varieties of seeds	Training farmers on Climate Smart Agriculture Practices and resistant seed varieties	Annex 18 includes the number of people adopting improved and/or new climate-resilient livelihood options
	Number of REEPS built	Climate smart water tanks installed and made available for livestock, crops, and farmers. Two models: conventional water storage tanks (gravity water tanks) and buried sand-filled water tanks	150 units of climate smart water tanks are installed
	Area with resilient fodder production	Training to improve the quality and quantity of fodder. Production of high-quality resilient fodder for the livestock	1 500 ha of land will be improved to produce resilient fodder
Activity 1.2.4. Promotion and dissemination of sustainable home technologies and social initiatives	Number of farmers using renewable energy and energy efficient and water efficient technologies	Identification of farmers benefiting from green renewable technology	2 500 farmers on the utilisation of new technologies
Activity 2.1.1. Reinforcement of unpaved rural access roads to reduce climate change impacts and water collection along these roadways for agricultural use	KM of roads repaired (repairs to critical sections of rural access roadways, drainage, pavement; construction of underground water recharge structures)	Identification of roads in need of repair and the works that need to be done; completion of road work; support to communes for the establishment of a maintenance program	540 km of roads are repaired or improved to make them more resilient to climate change
Activity 2.1.2. Training on construction standards related to climate change	Number of technicians trained on construction standards related to climate change	Information on and identification of individuals to train; organisation of training sessions; monitoring of the appropriation of knowledge	178 881 regional and local technicians trained on construction standards related to climate change
Activity 3.1.1 Training rural development actors on climate change and food production systems for enhanced nutrition	Number of rural actors trained on climate change impacts and measures (training on climate change; training on nutrition and gender; farmer field schools (FFS) on climate change)	Building awareness, information, training sessions; monitoring of the appropriation of knowledge; monitoring of their use Development/update of training manuals, organisation of training	447 201 trained rural actors 45 000 producers trained on improved management practices of which 50% are women and 30% are youth

		sessions through FFS and community-based SBCC activities Selection and awareness-building of trainees; organisation of farmer field schools; support for trained producers	
Activity 3.1.2. Exchange visits on climate resilient food systems	Number of people involved in exchange visits and indicating that their knowledge of climate adaptive practices has increased	Identification of best practices, organising exchange visits, promoting peer mentoring	360 participants in exchange visits
Activity 3.1.3. Capitalization of best practices and knowledge on food and nutrition security measures	Number of best practices products	Identification of best practices and successful approaches, carrying studies and publishing knowledge products	20 studies carried and knowledge products produced Degradation baseline enriched

E.7. Monitoring, reporting and evaluation arrangements (max. 500 words, approximately 1 page)

The monitoring, reporting and evaluation (M&E) system of DEFIS+ will focus on the results and outcomes identified in the logical framework and AWP/Bs. It follows the procedures clearly set out in the IFAD Monitoring Manual (third edition). This system is also used to assess the work of implementing partners in order to guarantee regular, systematic implementation of harmonised tools for data collection and management (databases, GIS) and reporting, as well as for knowledge management to evaluate knowledge capital and identify good practices.

A participatory M&E process will be used to ensure the establishment of a good understanding of stakeholders' expectations and a common approach since the beginning. This will facilitate the appropriation and adoption of the information and results of the analysis generated by the system. This approach seeks to engage all stakeholders in: establishing a deeper, common comprehension of the objectives, strategies and appropriate information needs; organising collective moments of critical reflection to adjust intervention strategies where needed; and using monitoring data as tools to support management and decision-making.

DEFIS+ M&E unit is led by an M&E officer, with the support of a specialist in charge of monitoring climate change adaptation that will be recruited, a national assistant and M&E officers based in the inter-regional coordination units. The M&E officer on climate change adaptation and mitigation, to be hired with GCF funds, will be fully responsible for all M&E and knowledge management activities financed by the project.

The M&E system will be used for: continuous, systematic internal monitoring of the implementation of planned activities and progress on different levels of outcomes, assessed on a biannual and annual basis; periodic internal evaluations specific thematic evaluations undertaken to respond to identified needs; and periodic external evaluations. The latter includes baseline surveys carried out at the beginning of the project and impact assessments at the project end to determine the benefits generated by the project activities.

The quantification of adaptation beneficiaries (direct) is based on two conditions. The first condition is that the individuals receive direct interventions from the GCF funded project. The 447,200 beneficiaries will benefit from the following interventions: i.) The development of efficient water management systems; ii.) Regular access to reliable-climate data; iii.) The diffusion and adoption of resilient agricultural inputs, new technologies, and management practices; iv.) Improved climate resilience of basic rural infrastructure; v.) Training and capacity building services; vi.) Knowledge management on the adaptation of food production systems to climate change and on carbon sequestration.

The second condition is that these beneficiaries receive measurable adaptation benefits. All of these interventions aim to increase the beneficiaries' adaptive capacity, which is a combination of assets and abilities that can be used to "prepare for and undertake actions to reduce adverse impacts, moderate harm, or exploit beneficial opportunities" (IPCC, 2012). The above interventions will directly lead to measurable adaptation benefits, including increased resilience

to climate change, increased food and water security, and improved livelihoods. The ToC describes the way in which the interventions will lead to these benefits. Food security, for example, is enhanced through improved agricultural production, while improved water security will be achieved through better water management practices.

The quantification of adaptation beneficiaries (indirect) will be a combination of primary and secondary data collection and extrapolation. Primary data collection will consist of surveys, and secondary data collection will consist of reviewing and triangulating national census data and information gathered from government counterparts and other agencies in the project area. It is envisaged that the following beneficiaries will be considered indirect beneficiaries of adaptation interventions. Details are included in Annex 11 (page 1-3 and tables).

Twice a year, the Government (MINAE, MEF, MEDD, and NDA) and IFAD will organise supervision missions with the goal of assessing progress on activities and the level of funds disbursement, the observance of administrative and financial procedures and the ability of the project activities to contribute to the achievement of the project's objectives.

DEFIS+ will publish on a biannual and annual basis a progress report that presents an overview of the activities carried out and their cost, the products and results obtained and the level of progress achieved on the objectives defined in the AWP/Bs as well as the expected outputs and outcomes. These reports will be distributed to the line ministry, NSC members, the NDA and IFAD. DEFIS+ will promote knowledge and learning in all investment areas, including the design and development of resilient agricultural infrastructures and production systems and efficient water management techniques. The overall approach to knowledge and learning relies on learning-based approaches such as farmer field schools, exchange visits, communities of practice, learning routes, contributions to thematic networks, e-Library, training, and capacity support and on already proven knowledge management methods and tools. The goal is to generate a detailed repertoire of good practices in the area of climate change adaptation.

DEFIS+ Outcome 3 is specifically designed to identify paths to knowledge development and build on partnerships between public and private entities to generate and disseminate further learning. The DEFIS+ M&E officer will be in charge of supporting these knowledge management activities in close collaboration with the local IFAD M&E officer. Approaches to identifying and disseminating lessons learned will include the use of various tools, including websites, case studies, policy briefs, training sessions, knowledge sharing events and workshops, radios, etc.

DEFIS+ will create sustainable enabling conditions for both climate change adaptation and rural economy transformation by building the capacity of local actors and regional authorities to plan infrastructure (e.g., rural roads and water management infrastructures) and natural resource use in line with expected climate change impacts. Furthermore, through Outcome 3, DEFIS+ will support an enhanced policy dialogue and the development of evidence-based policies. The GCF investments will lift the structural barriers to resilient agriculture related to infrastructures, production systems and/or capacity, which will further contribute to create an enabling environment. Assistance to key rural stakeholders such as chambers of commerce, farmer associations and market organisations will also help lift institutional barriers and create an environment that is more conducive to a productive and climate resilient sector and economy. Annex 11 includes a full description of the Monitoring and Evaluation Plans.