Funding Proposal Template for Adaptation Fund Climate Innovation Accelerator (AFCIA) fully-developed programme proposals

PROGRAMME ON INNOVATION: AFCIA PROGRAMMES

REQUEST FOR PROJECT FUNDING FROM THE ADAPTATION FUND

The annexed form should be completed and transmitted to the Adaptation Fund Board Secretariat by email.

Please type in the responses using the template provided. The instructions attached to the form provide guidance to filling out the template.

Please note that a project must be fully prepared when the request is submitted.

Complete documentation should be sent to:

The Adaptation Fund Board Secretariat
1818 H Street NW
MSN N6-600
Washington, D.C., 20433
U.S.A
Email: afbsec@adaptation-fund.org

MULTI/ REGIONAL INNOVATION PROJECT/PROGRAMME PROPOSAL

PART I: PROJECT/PROGRAMME INFORMATION

Title of Project/Programme:	ASAP+ Adaptation Innovation Centre
Geographic Scope (Multi/Regional):	Global (through regional call for proposals)
Thematic Focal Area[1]:	Innovation in adaptation finance.
Type of Implementing Entity:	Multilateral Implementing Entity (MIE)
Implementing Entity:	IFAD through ASAP+ Trust Fund
Executing Entities:	IFAD
Amount of Financing Requested:	US$ 10 million (in U.S Dollars Equivalent)

[1] The programme can have a thematic focus or foci, such as the following (i.e. this is not an exhaustive list): Agriculture and food security; Disaster risk reduction and early warning systems; Forests and land use management; Human health, including maternal and child health and welfare etc; Innovative adaptation financing; Local traditional ecological knowledge solutions, including harnessing or revival of indigenous, traditional solutions; Marine, fisheries, and oceans adaptation; Nature-based solutions, including ones that are biodiversity-supporting, in various settings (e.g. urban, peri-urban and non-urbanized); Urban adaptation and Water management

Contents

List of tables and figures

Project / Programme Background and Context:

Introduction

Climate change and biodiversity loss pose significant and interconnected threats to global food security. Ten per cent of current agricultural areas are projected to become climatically unsuitable by mid-century, reaching up to 30 per cent by 2100[2]. Despite producing 35 per cent of the world's food, and up to 80 per cent in sub-Saharan Africa, small-scale farmers are disproportionately affected by these shifting baselines. Their limited access to finance and appropriate technologies severely reduces their capacity to adapt to rising temperatures and erratic rainfall. This vulnerability is exacerbated by a structural market failure whereby small-scale agrifood systems receive only 0.8 per cent of total tracked climate finance, creating a staggering unmet financing gap estimated at US$ 230 billion per year[3]. It is estimated that adaptation finance must increase nearly 14-fold to reach a minimum of US$75 billion per year to meet their needs[4]. This funding shortfall leaves farmers without the capital to invest in climate-resilient practices and technologies.

Compounding this financial deficit is a critical innovation gap. The lack of dedicated investment has created a widening gap between early-stage research and commercial scale, where high potential solutions fail to reach the market. Moreover, the perceived low commercial viability of small-scale agriculture has stifled research and development (R&D) of new technologies and practices tailored to their specific needs. As a result, even if finances were available, the climate adaptation solutions themselves are often lacking or targeted to commercial farming systems that do not translate to small-scale systems.

To address this dual challenge, this application proposes the establishment of the ASAP+ Adaptation Innovation Centre. The Centre will serve as a scaling platform, utilizing a grant mechanism and knowledge platform to catalyze locally led climate innovations specifically targeting small-scale agriculture. The Centre aims to enhance innovation through investing in research, development and piloting that will pioneer new climate resilient and adaptive technologies and practices for small-scale agricultural systems.

Through its grant mechanism it will mobilize risk-taking capital in the form of grant resources to support local organizations in developing innovations. Additionally, key components of the Centre will enable knowledge generation and dissemination and directly enable scaling of proven concepts through IFAD's wider investments by embedding appropriate innovations into IFAD's pipeline. Consequently, this initiative will not only bridge the financial gap for climate adaptation innovation in the sector, but also result in the scaling of proven, effective and affordable solutions that can be adopted by small-scale farmers at local, regional and global levels. By investing in this high-risk, high-reward space, we can unlock the potential of millions of farmers, enhance their climate resilience, and support the stability of the global food system.

Rationale for climate innovation in small-scale farming systems

[2] IPCC. 2023. Summary for Policymakers. In Climate Change 2023: Synthesis Report.
[3] ISF Advisors. 2025. Beyond the Frontier: Decoding viability in smallholder finance. New York.
[4] Daniela Chiriac, Harsha Vishnumolakala and Paul Rosane, The Climate Finance Gap for Small-scale Agrifood Systems: A growing challenge (Climate Policy Initiative, November 2023), https://www.climatepolicyinitiative.org/wp-content/uploads/2023/11/The-Climate-Finance-Gap-for-Small-Scale-Agrifood-Systems-3.pdf

Small-scale farmers, including Indigenous Peoples, play a pivotal role as custodians of agrobiodiversity and in maintaining healthy ecosystems, occupying 12 per cent of agricultural land worldwide. Their longstanding relationship with the land provides a foundation for sustainable resource management and supports the resilience of farming systems to climate change. By empowering small-scale farmers with the resources and knowledge needed to adopt innovative climate-resilient approaches, we can safeguard vital agricultural landscapes and strengthen the adaptive capacity of rural communities to climate impacts. While some traditional indicators are becoming less reliable, and coping mechanisms are being outpaced by the speed of climate change, many time-tested and locally-adapted methods, crops and species, offer crucial strategies for long-term food security and climate adaptation.

Investing in climate innovations for small-scale farmers is crucial because it directly enhances their livelihoods, empowering them to invest in and sustain their land in the long term and increases the sustainability of rural systems. Grant financing is critical here as it enables risk taking to pioneer new technologies and practices that are more resilient and effective. Further, successful innovations lead to multiplier effects throughout rural economies, with climate resilient agricultural innovations boosting farmer incomes and generating new value streams that particularly benefit rural communities, who face the greatest barriers to accessing commercial financing to enhance their farming practices.

Innovation in technology and agricultural practices is fundamental to advancing this transformation. The adoption of more effective and efficient innovative technologies, including precision agriculture tools, cost-effective soil monitoring solutions, and advanced water conservation techniques, reduces the risks associated with sustainable methods, thereby making them more appealing to private investors and facilitating essential capital flows. Additionally, the development of new technologies, such as drought-resistant crop varieties and intelligent irrigation systems, has the potential to substantially enhance yields and optimize resource utilization, particularly water conservation, increasing the resilience of small-scale farming systems in the face of intensifying climate challenges.

Furthermore, the integration of indigenous and traditional knowledge with modern scientific techniques and technologies is vital, as it can profoundly increase production as well as enhance provisioning and regulating ecosystem services that are critical for sustaining agricultural systems under stressed climate conditions. The utilization of new technologies can also open new markets for small-scale farmers or support improved food processing and storage practices, significantly reducing post-harvest waste and enhancing food security in the face of increasing temperatures and extreme weather events. The programme explicitly targets ancestral innovation and the integration of Indigenous knowledge with modern science. By validating time-tested practices (such as traditional water harvesting) alongside digital tools, the programme creates culturally grounded solutions that ensure food security and reduce post-harvest waste in the face of extreme weather.

These innovative approaches not only strengthen their adaptive capacity but also yield substantial economic returns; for instance, every US$1 invested in ecosystem restoration can generate US$7 to US$30 in economic returns through improved ecosystem services and sustainable production[5].

[5] World Bank. 2021. Protecting nature could avert global economic losses of US$2.7 trillion per year

Consequently, by investing in climate-adaptive and resilient innovations in the sector, we empower rural small-scale farming communities to confidently invest in long-term solutions that boost productivity, build climate resilience, and protect precious natural resources and biodiversity. This ultimately secures food security and enhances livelihoods for future generations while advancing agricultural systems in the face of threats posed by the changing climate.

Background: IFAD Multilateral Implementing Entity

IFAD holds a distinct position as the world's second largest multilateral investor in food and agriculture, investing in rural people and small-scale producers to equip them with the tools to transform local food systems for sustainable change. Investing in climate change adaptation, promoting climate resilient investments and mobilizing climate finance is fundamental to IFAD's work on rural development and poverty reduction.

During IFAD's last funding cycle (Twelfth Replenishment of IFAD Resources 2022-2024), IFAD allocated 49 per cent of total investments to climate finance in support of interventions that enhance climate resilience, improve productivity and rural livelihoods. IFAD is scaling its work on climate and biodiversity supporting countries to effectively integrate climate adaptation, environmental sustainability and biodiversity management into policies and investments and deploying diverse financing tools to implement the new, first of its kind, integrated Climate, Environment and Biodiversity Strategy 2025–2031. This ensures that the innovation process is not a temporary project output but a permanent feature of national development, aligning perfectly with the Adaptation Fund's (AF) vision of sustainable scaling.

The Strategy builds on IFAD's track record by promoting a comprehensive response to the interconnected climate, environmental, and biodiversity-related threats facing small-scale farmers. Focusing on the sustainable use and conservation of natural resources and biodiversity within agricultural systems, the strategy aims to build the resilience of rural communities to climate change and promote long-term development. It also recognizes that protecting rights, strengthening governance systems, and valuing Indigenous Peoples' knowledge are essential to achieving lasting climate and environmental outcomes. Ten action areas are outlined in the strategy, offering adaptive and flexible solutions for countries to select when designing investment projects depending on the context, capacities, national priorities and income levels. The actions areas help deliver the overarching objectives of the strategy: 1) scaling of climate resilient and environmentally sustainable practices, 2) enabling targeted and innovative financial practices, and 3) strengthening the enabling environment for long-term sustainability. Central to the action areas are forward looking and innovative practices and diverse financing sources, aligning with the AF Climate Innovation Accelerator (AFCIA).

Adaptation for Smallholder Agriculture Programme (ASAP+): strategic alignment with AFCIA

ASAP+ is a Trust Fund established within IFAD's financial architecture and is an important vehicle in driving forward the new strategy through its 100 per cent climate adaptation earmarking. Specifically, ASAP+ addresses climate change-induced food insecurity and builds the resilience of vulnerable

communities with a focus on rural women, youth, Indigenous Peoples and other marginalized groups. To achieve this, it unlocks climate finance grants for smallholder farmers, promoting farm-level innovations rooted in local contexts and catalyzing partnerships with both the public and private sectors.

ASAP+ was established in 2021 building on the success of the programme's previous phases (ASAP1 and 2, established 2012) and leverages over a decade of results and learning building the resilience and sustainability of small-scale farming systems. To date it remains the world's largest dedicated Trust Fund to climate adaptation in small-scale farming systems.

Through ASAP1, IFAD raised over US$ 310 million in grant resources and channeled these through IFAD's broader investment portfolio, benefiting rural communities in over 40 countries. More than 7.2 million small-scale farmers have been made more climate resilient due to ASAP investments in climate adaptive practices. Table 1 below highlights some of the results from ASAP 1.

	**7.2 million** beneficiaries with increased climate resilience
	**404,000** beneficiaries with increased water security
	**US$ 128 million** new or existing infrastructure made climate resilient
	**1.7 million** ha of land under climate resilient practices
	**52 million** tCO_2eq avoided or sequestered

Table 1: ASAP 1 Results

Investing in innovation has been a cornerstone of ASAP, which as a grant mechanism has been IFAD's risk-taking mechanism to invest in climate adaptation. This has helped IFAD demonstrate the viability and effectiveness of innovative adaptation initiatives and resulting in greater willingness to operationalize loans for adaptation action at scale. ASAP has successfully leveraged public and private climate finance, promoted nature-based solutions, implemented climate-resilient infrastructure and early warning systems while empowering marginalized communities including women, the youth and Indigenous Peoples. Box 1 below highlights some of the innovations supported through ASAP.

1) Climate-sensitive innovations in Viet Nam's Mekong Delta

ASAP investments in the Adaptation to Climate Change in the Mekong Delta in Ben Tre and Tra Vinh provinces (AMD) Project in Viet Nam helped kick-start and institutionalize climate adaptation initiatives by combining piloting of innovations with capacity building and policy engagement for lasting impact. 130 locally relevant innovations centered on novel salinity monitoring tools and integration with early warning systems were tested and piloted across three agroecological salinity zones. The project held extensive consultations with local actors including communities, government and the private sector to demonstrate the viability of these innovations and ensure that farmers have the confidence to adopt new practices. ASAP also facilitated the inclusion of these innovations in provincial policies ensuring that future public and private investments could be aligned with these frameworks for greater impact. (Resources: IFAD, 2023. ASAP Innovations, Policy and Scaling.)

2) Sustainable management of natural resources in Sudan's Butana region

In Sudan, ASAP provided an entry-point for approaches focused on nature-based solutions that generated benefits for both biodiversity and the community. By implementing a natural resources governance framework (NRGF) through the Butana Integrated Rural Development Project (BIRDP), ASAP empowered communities to sustainably manage natural resources in the target areas and reduce conflicts amongst settled farmers and transhumant pastoralists. This led to the development and creation of range reserves and communal forests, the construction and rehabilitation of water structures, the demarcation of 2,000 km of fire lines in community forests and the introduction of drought resistant fodder plants as part of the project's agroforestry initiatives, resulting in increased climate resilience and reduced resource conflict. (Resources: IFAD, 2021. ASAP Technical Series: Nature-based Solutions.)

Box 1: ASAP Innovations

A key mechanism of ASAP is to increase climate resilience and maximize adaptation benefits has been the integration of modern approaches with traditional or Indigenous knowledge. Through participatory approaches and by recognizing and incorporating this knowledge in climate adaptation strategies and approaches ASAP has been empowering indigenous peoples. Box 2 below presents a case study to show how ASAP has empowered Indigenous Peoples in Indonesia. Indigenous Peoples are recognized as key agents in global climate action due to their deep connection with the land and ecosystems. ASAP, where contextually appropriate, has leveraged their unique knowledge systems to promote climate action and biodiversity conservation while enhancing their livelihoods.

Building on ASAP 1 and 2, ASAP + is designed to increase the climate resilience of 10 million vulnerable people, particularly women and youth, and thus bring about an increase in food and nutrition security in low-income countries. To do that, the new strategic approach of ASAP+ over the period of 2025 to 2028 will target investments across six impact areas:

I. **Nature-based solutions**: Potential to enhance climate change adaptation, biodiversity and societal challenges through innovative solutions based on natural resource management and conservation
II. **Financial instruments for adaptation**: Development of long-term adaptation financing models to crowd-in finance.

III. **The climate-gender-nutrition nexus**: Recognition of the gender-differentiated impacts of climate change and use of gender-sensitive approaches to improve food and nutritional security for both genders.

IV. **Market based mechanisms**: Pioneering frameworks and increasing linkages of existing mechanisms to climate-resilient agricultural practices to increase revenue at the farm-level.

V. **Climate information services**: Provide timely, relevant and contextualized climate information to smallholder farmers for greater impact.

VI. **Impact accelerator lab.** Drive transformative change through innovative adaptation solutions.

Leveraging traditional knowledge to drive climate action in Indonesia

In Indonesia ASAP2 investments in the Renewable Energy Solutions for Village Electrification - Transferring Indigenous Energy Knowledge from Malaysia to Indonesia (RESOLVE) facilitated a partnership with the Indigenous Peoples' Alliance of the Archipelago to empower communities in East Nusa Tenggara and North Kalimantan. The project integrated traditional knowledge with modern renewable energy technology to safeguard water resources while ensuring local ownership and fostering long-term resilience. ASAP+ will continue to invest in and empower indigenous people to build resilience against climate change through its collaboration with the Indigenous Peoples Assistance Facility (IPAF).

IPAF is an innovative funding instrument that Indigenous Peoples' communities can use to find solutions to the challenges they face. Through IPAF, IFAD directly finances projects designed and led by indigenous communities, allowing them to choose the most suitable interventions based on their traditional values and environmental knowledge. Since 2007, IPAF has financed 159 projects across 54 countries. The latest replenishment, IPAF6, focuses on enhancing Indigenous Peoples' efforts in conservation and sustainable biodiversity management to adapt to and build resilience against climate change. IFAD will continue to strengthen IPAF, in particular as a channel for providing direct access to climate finance to Indigenous Peoples.

Box 2: Empowering Indigenous Peoples through innovation integration under ASAP

In line with Action Area 6 Impact Accelerator Lab, this proposal aims to identify, invest in and scale innovative solutions that are urgently needed to address the impacts of climate change on small scale farming systems. ASAP+ will leverage technological advancements, data-driven insights, and collaborative partnerships, to drive research and development for transformative change, integrating traditional knowledge and practices with modern technologies to create sustainable and equitable agricultural systems. Innovations to be financed under this proposal will target populations that face the greatest challenges in terms of climate vulnerability, rural poverty, fragility, institutional capacity and food insecurity, in line with IFAD's targeting policy. Further, it will leverage IFAD's wider investment portfolio to scale successful innovations supported through the AFCIA grant.

Project / Programme Objectives:

The ASAP+ Adaptation Innovation Centre will target three interlinked Objectives to catalyze innovation of climate adaptation technologies and practices at farm-level and provide the relevant evidence and knowledge base to scale these innovations through IFAD's wider investments and operations. These objectives correspond to each of the three programme components and will help meet the **overarching goal**: to strengthen the climate resilience and food security of small-scale farmers by enabling risk-taking and supporting the development, adoption, and scaling of locally appropriate, innovative adaptation solutions that reduce climate risks and sustain agricultural productivity and livelihoods.

Objective 1: Catalyze new climate resilient technologies and practices through financing of innovative grant proposals.

The Objective will invest in research and development of new innovative technologies and de-risk the piloting of practices and technologies in new contexts (fostering greater inter regional coordination and innovation). It will drive transformative change by i) developing new technologies and practices and ii) integrating traditional and Indigenous knowledge and practices with modern technologies, supported by data-driven insights and collaborative partnerships. Grants will be used to enable targeted institutions/grantees to take on risks and catalyze and institutionalize new climate adaptation solutions that address the significant threats climate change poses to small scale agriculture yields and markets.

Objective 2: Knowledge generation and dissemination of successful innovations and lessons learned.

The objective will utilize ASAP+ and IFAD's wider Monitoring and Evaluation System to evaluate the impact of innovation grants to identify successful innovations for scaling under Objective 3. Further, the Objective will develop succinct and targeted knowledge products for publication to showcase best practices and lessons learned from innovation grants under Objective 1. The programme will foster learning, awareness raising and knowledge generation at the grassroots level through plugged into IFAD's peer-to-peer and community platforms. This will enable dissemination of critical knowledge of innovations to facilitate replication at scale or in new contexts for long-term adaptation to climate change. Importantly, this will build into IFAD's partnership with South-South and Triangular Cooperation (SSTC), supporting interregional knowledge transfer to foster increased uptake of innovations. All knowledge disseminated will comply with IFAD and AF rules on intellectual property and other relevant policies.

Objective 3: Scaling successful innovations through linkage to IFAD's wider investment portfolio.

Successful innovations will be identified and technical assistance provided to promote inclusion into IFAD's Programme of Loans and Grants (PoLG). This ensures that proven concepts move beyond piloting, post programme, to reach a larger number of beneficiaries by leveraging IFAD's concessional loans, and its financial and operational infrastructure. Scaling will target both i) IFAD's sovereign operations, embedding innovations in nationally led initiatives to foster greater uptake and

buy in at national levels, and ii) non-sovereign operations to embed suitable technologies into public-private-producer partnerships to accelerate private sector uptake of proven innovative and risk reducing climate-oriented technologies.

Programme Theory of Change

The programme's theory of change is that **IF** targeted grant financing de-risks and drives development of climate-resilient innovations tailored for small-scale farmers, particularly women, youth, and Indigenous Peoples; **AND** these innovations are backed with evidence-based knowledge and institutional support to take them to scale; **THEN** small-scale farming systems will have increased capacity to mitigate climate risks, sustain and increase productivity, and secure long-term food livelihoods.

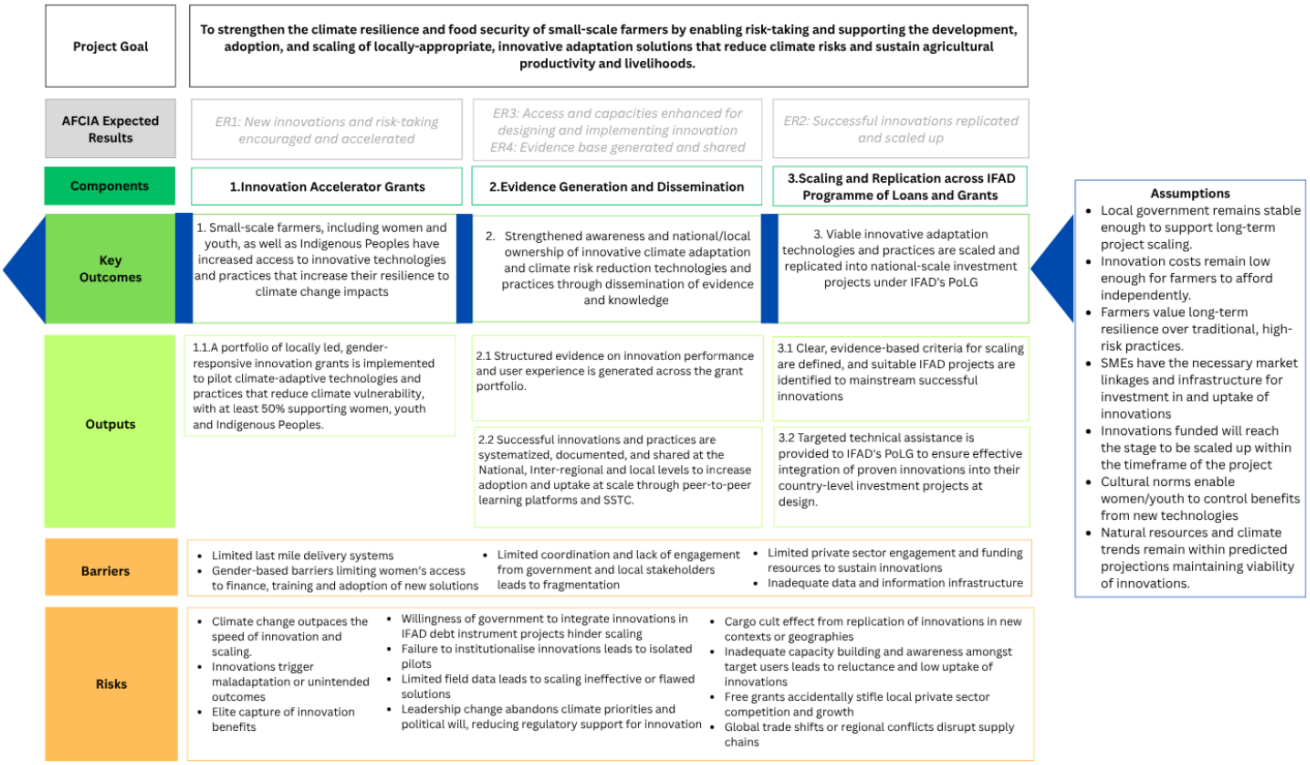


Figure 1: ASAP+ Adaptation Innovation Centre Theory of Change

Through Component 1, innovation grants reduce financial and operational risks associated with experimentation, allowing diverse actors to pilot solutions across different innovation maturity stages. This generates locally validated innovations and stimulates behavioural change among users and innovators, including increased willingness to test new practices and technologies.

Component 2 strengthens the enabling environment for adoption. Community peer-learning platforms, participatory feedback mechanisms, and inclusive knowledge processes build trust in innovations, strengthen awareness of climate risks, and enhance users' capacity to integrate solutions into existing livelihood systems. At the same time, structured monitoring, evaluation and

learning systems transform implementation experience into credible evidence on effectiveness, inclusiveness, safeguards compliance, and cost-efficiency. By pairing innovation financing with targeted monitoring, evaluation and learning systems, the Innovation Centre will generate robust evidence on what works, for whom, and under what conditions. This evidence will strengthen local ownership and inform structured pathways for scaling successful solutions through IFAD's PoLG. The assumption is that validated evidence and operational business cases reduce investment risk and enable public actors to commit financing for scaling through IFAD-supported investments.

The programme recognizes that the transition from innovation learning to large-scale adoption depends on intermediate behavioural and institutional changes rather than the automatic expansion of successful pilots. Evidence generated through innovation testing and learning activities is expected to influence decision-making across multiple levels of the agricultural system. At the farmer level, peer learning, demonstrations, and locally validated evidence reduce perceived risk and increase confidence to adopt climate-resilient practices. At the institutional level, IFAD country teams and project teams use structured evidence, scaling packages, and technical support to reduce uncertainty around performance, cost, and implementation feasibility, enabling informed investment decisions. Government agencies and project management units are supported to integrate proven innovations into extension services, programmes, and financing frameworks, strengthening ownership and long-term sustainability. Through this integrated approach, linking innovation, learning, and scaling, the Innovation Centre will reduce barriers to adoption, mitigate the risks of maladaptation, and enable the diffusion of proven climate adaptation solutions at scale.

Project / Programme Components and Financing:

Project/Programme Components	Expected Outcomes	Expected Outputs	Countries	Amount (US$)
1. Innovation Accelerator Grants	1 Small-scale farmers, including women and youth, as well as Indigenous Peoples have increased access to innovative technologies and practices that reduce their vulnerability to climate change impacts	1.1 A portfolio of locally led, gender-responsive innovation grants is implemented to pilot climate-adaptive technologies and practices that reduce climate vulnerability, with at least 50% supporting women, youth and Indigenous Peoples.	Multi-regional	6 490 928
2. Evidence Generation and Dissemination	2 Strengthened awareness and national/local ownership of innovative climate adaptation and climate risk reduction technologies and practices through dissemination of evidence and knowledge.	2.1 Structured evidence on innovation performance and user experience is generated across the grant portfolio. 2.2: Successful innovations and practices are systematized, documented, and shared at the National, Inter-regional and local levels to increase adoption and uptake at scale through peer-to-peer learning platforms and SSTC.	Multi-regional	1 517 664
3. Scaling and replication across IFAD Programme of	3.Viable innovative adaptation technologies and practices are scaled and replicated into national-scale	3.1 Clear, evidence-based criteria for scaling are defined, and suitable	Multi-regional	945 953

Loans and Grants (PoLG)	investment projects under IFAD's PoLG	IFAD projects are identified to mainstream successful innovations 3.2 Targeted technical assistance is provided to IFAD's PoLG to ensure effective integration of proven innovations into their country-level investment projects at design		
6. Project/Programme Execution cost				136 364
7. Total Project/Programme Cost				9 090 910
8. Project/Programme Cycle Management Fee charged by the Implementing Entity (if applicable)				909 090
Amount of Financing Requested				10 000 000

Table 2: Programme Components and Financing

Projected Calendar:

Milestones	Expected Dates
Start of Project/Programme Implementation	January 2027
Mid-term Review (planned)	June 2030
Project/Programme Closing	January 2033
Terminal Evaluation	June 2033

PART II: PROJECT/PROGRAMME JUSTIFICATION

A. Describe the project / programme components, particularly focusing on the concrete adaptation activities, how these activities would contribute to climate resilience. Describe also how they would build added value through the regional or multi-regional approach, compared to implementing similar activities in each country individually. Furthermore, show how the combination of individual projects would contribute to the overall increase in resilience.

Project components and activities

Programme Goal:

The programme aims to **strengthen the climate resilience and food security of small-scale farmers by expanding access to innovative, locally appropriate adaptation solutions that address increasing climate risks**. Recognizing that effective climate adaptation requires experimentation, learning, and informed risk-taking, the programme supports the development, testing, and scaling of innovations that enhance agricultural productivity, safeguard livelihoods, and build resilience to climate shocks and stresses. By combining targeted financing, evidence generation, inclusive capacity strengthening, and pathways for institutional scaling, the programme enables solutions that are responsive to local contexts, inclusive of women, youth, and Indigenous Peoples, and capable of being sustained and expanded through national systems and IFAD-supported investments.

Component 1: Innovation Accelerator Grants

Outcome 1: Small-scale farmers, including women and youth, as well as Indigenous Peoples, have increased access to innovative technologies and practices that increase their resilience to climate change impacts.

Aligns with AF Strategic Results Framework (SRF) Outcome 8 and AFCIA Expected Result 1.

Component 1 delivers adaptation impact by enabling locally led organizations to develop and test climate-adaptive solutions that perform under real farming, climate and market conditions. By financing research and development of locally led innovations it aims to strengthen the ability of agricultural and value chain actors to anticipate climate risks, adapt production practices, protect assets and stabilize livelihoods. Grants will target a range of local innovators, public institutions, research actors, Indigenous Peoples Organizations and implementation partners to translate adaptation ideas into practical solutions across value chains.

The component does not mandate a single innovation model but promotes integrated “resilience bundles” that combine climate-smart practices, nature-based solutions, information services, finance, post-harvest options, and market connections. These combined approaches help farmers use information effectively, support lasting adoption, and deliver better resilience results than isolated interventions.

All supported innovations will align with priority cross-regional thematic windows identified in Annex 1. These thematic areas reflect persistent adaptation gaps where innovation can deliver high resilience gains for vulnerable rural populations.

The component uses a portfolio approach to support innovations with different technological complexity, readiness, and climate impact. Simple solutions like agroecological practices bring quick, local benefits in areas with limited capacity, while complex digital tools drive large-scale change where conditions allow. Selection focuses on context-appropriate adaptation, piloting feasibility, strong business plans, and potential for practical learning in small-scale farming.

Selection criteria (Section C) also recognize that high-value adaptation innovations emerge at different stages. The portfolio will include early-stage concepts, innovations already demonstrated in one region and adapted to new contexts, and more advanced solutions ready for broader replication. Where appropriate, selection will also consider the potential for successful innovations to be integrated into IFAD's PoLG, strengthening pathways to scaling under Component 3.

Gender equality, youth inclusion and Indigenous Peoples' participation are treated as core design requirements. At least 50 per cent of supported innovations will directly prioritize or benefit women, youth and Indigenous Peoples, addressing structural barriers such as access to land, finance, services, digital tools and markets through inclusive design and delivery models.

Subcomponent 1.1: Innovation Grant Portfolio

Output 1.1: A portfolio of locally led, gender-responsive innovation grants is implemented to pilot climate-adaptive technologies and practices, with at least 50 per cent directly supporting women, youth and Indigenous Peoples.

Aligns with AF SRF Output 8.1.

This output delivers adaptation benefits by financing and implementing a portfolio of innovation grants that pilot climate-adaptive technologies and practices in real-world small-scale farming contexts. Interventions will take place across diverse agroecological and socio-economic settings, enabling participating farmers and institutions to test and refine solutions under actual operating conditions.

The portfolio approach allows different innovation types to be implemented in parallel, including, but not limited to production practices, nature-based solutions, climate information services, post-harvest solutions and delivery models, where relevant. The focus of this output is on executing and managing the grants effectively, ensuring innovations are piloted in inclusive and operationally sound ways.

The following activities are the enabling mechanisms through which the innovation grant portfolio is delivered and its adaptation outcomes achieved.

Activity 1.1.1) Source and select locally led adaptation innovations

A structured and inclusive process will be applied to identify innovation proposals aligned with priority thematic areas and local climate risks. Competitive calls for proposals will be launched to attract locally led solutions, with targeted outreach to women-led, youth-led and Indigenous Peoples' organizations. For the latter, the IFAD's Indigenous Peoples Assistance Facility (IPAF) will serve as mechanism to issue the calls for proposals. Proposals will be assessed against transparent screening criteria (Section C) emphasizing adaptation impact, inclusiveness, feasibility, learning value and potential relevance for future scaling. This activity ensures that the portfolio reflects diverse contexts, innovation stages and delivery models while remaining focused on reducing climate vulnerability.

Activity 1.1.2) Strengthen innovation readiness through TA and de-risking

Selected innovations (a total of around 30 solutions will be funded ranging from USD 75,000 – USD 250,000) will receive targeted technical assistance (TA) to refine design and implementation during start up and execution. This will be provided by the dedicated AFCIA team under the ASAP+ programme. TA processes will engage end users and local institutions to adapt solutions to specific climate risks, farming systems and social contexts. This activity will address technical, operational, institutional and safeguard-related risks, integrate gender-responsive approaches and Indigenous knowledge where relevant, and ensure innovations are feasible, inclusive and ready for real-world testing.

Activity 1.1.3) Grant Awards and implementation

Innovation grants will be awarded and channeled under IFAD's grant procedures and adhere to IFAD's fiduciary and safeguards frameworks. Grants will be implemented at the local level in relevant agroecological and socio-economic settings. Performance, adoption and resilience-related outcomes will be monitored, generating evidence on effectiveness, usability, inclusiveness and sustainability. The evidence produced under this activity feeds directly into learning, knowledge generation and dissemination under Component 2, and informs scale-up and replication pathways under Component 3.

Component 2: Evidence Generation and Dissemination

Outcome 2: Strengthened awareness and national/local ownership of innovative climate adaptation and climate risk reduction technologies and practices through dissemination of evidence and knowledge.

Component 2 complements the Innovation Accelerator Grants under Component 1 by ensuring that climate adaptation innovations are effectively documented and translated into actionable knowledge to facilitate future scaling under Component 3. It focuses on strengthening the human, institutional, and monitoring systems required for rigorous knowledge generation. Throughout the implementation of the innovation grants, a strong emphasis is placed on the systematic documentation of evidence regarding what works, for whom, and under what conditions.

The component employs a two-tiered approach: evidence generation at the individual grant level, followed by aggregation and knowledge synthesis at the programme level. This ensures that raw data from diverse pilots is transformed into systematized insights. This knowledge is then disseminated through established channels, leveraging existing peer-to-peer mechanisms at the local level and SSTC at the global level.

Implemented in parallel with Component 1, these activities capture learning across the different stages of the innovation cycle. Through regular monitoring and engagement, Component 2 ensures that innovations remain grounded in local realities and are continuously refined through user feedback. This creates a robust evidence base and learning system designed to inform wider uptake across IFAD operations and partner institutions

Subcomponent 2.1: Evidence generation

Output 2.1: Structured evidence on innovation performance and user experience is generated across the grant portfolio.

This output ensures that evidence from AFCIA-supported innovations under Component 1 is systematically captured in a consistent and rigorous manner at the grantee level across all stages of implementation, from concept development and piloting to early and catalytic scale. The focus of this

output is on generating high-quality, comparable data that documents innovation performance, user experience, and contextual adaptation processes. By systematically collecting data and evidence on inclusive practices across the grant portfolio, it provides a structured record of what works, for whom, and under what conditions. This data and evidence serve as a foundation for knowledge generation (under Subcomponent 2.2) for stakeholders to understand innovation performance, support informed decision making for adoption of innovations at the local level, and provide products for dissemination at national and inter-regional levels under Subcomponent 2.3.

Activity 2.1.1) *Establish and operationalize an innovation-focused MEL framework for knowledge systematization*

Design, operationalize and maintain an innovation-focused Monitoring, Evaluation and Learning (MEL) framework to systematically capture, aggregate and synthesize evidence and learning from AFCIA-supported innovations and community-level platforms across countries and innovation stages. The MEL framework will apply an innovation-stage differentiated learning approach, adapted from the United Nations International Children's Emergency Fund (UNICEF) Innovation Monitoring and Learning Toolbox, to generate comparable and actionable evidence on performance, inclusiveness, resilience outcomes, cost-effectiveness and scalability, refer to Figure 2 below.

MEL findings will be routinely fed into programme governance and innovation management processes to inform adaptive management, refinement of innovation design, and decisions on continuation, piloting or scaling of supported innovations. Regular learning reviews and reflection sessions will be convened with innovators, users and relevant stakeholders to translate evidence into action. Data will be disaggregated by sex, age, demographic and relevant vulnerability criteria to inform gender-responsive and socially inclusive systematization.

The MEL framework will also integrate monitoring of compliance with the Adaptation Fund Environmental and Social Principles (ESP), Gender Policy and IFADs Social, Environmental and Climate Assessment Procedures (SECAP). Innovators across all innovation stages will be supported from the selection phase to ensure that 1) they are familiar with AF ESP and Gender Policy and IFAD SECAP 2) have the necessary technical expertise within their team to monitor compliance throughout

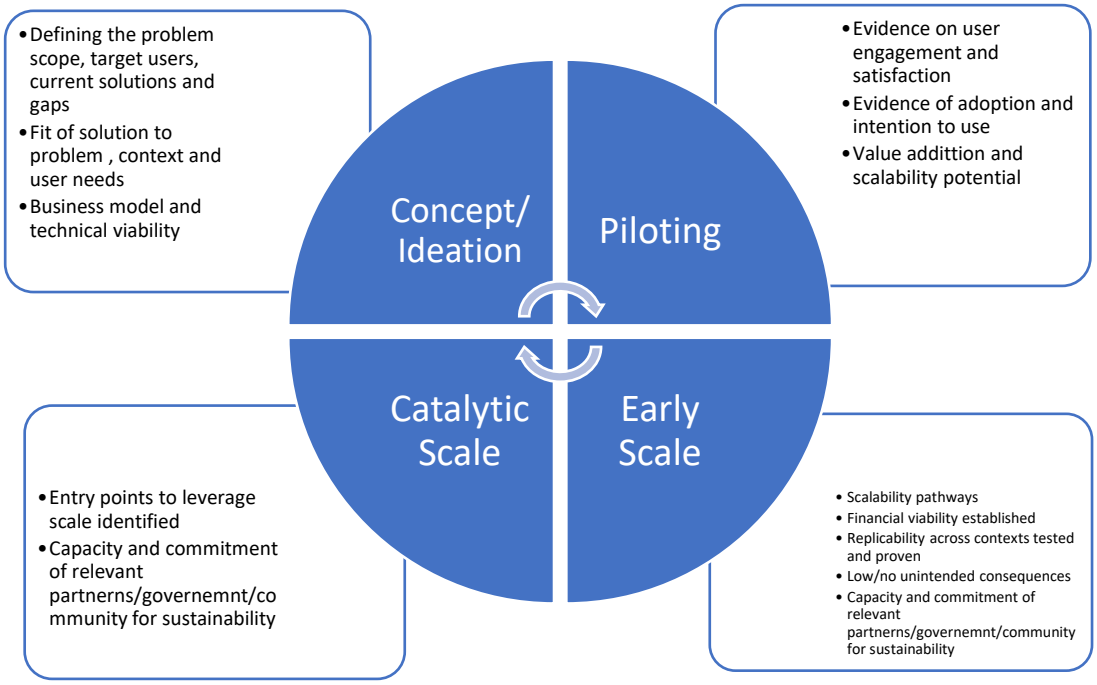


Figure 2: Monitoring, Evaluation and Learning Cycle across AFCIA Project Innovation Stages – adapted from UNICEF Innovation MEL Toolbox

the duration of the sub-projects and 3) they have a system in place for data collection, monitoring and reporting at the sub-project level to be tracking compliance and that this system feeds into the wider system at project-level where all data will be aggregated. The safeguard specialist for the project will have a key role in coordinating these activities and ensuring that data is monitored and reported.

Together, this activity will ensure that the programme not only tracks results, but actively learns from innovation, strengthens accountability, reduces the risk of maladaptation, and builds a robust evidence base to inform scaling of climate-resilient, inclusive solutions across IFAD-supported programmes and beyond.

Activity 2.1.2) Generate evidence on innovation performance and user experience

The MEL framework will be passed down through grant agreements and applied to capture evidence systematically from all AFCIA-supported innovations. Quantitative data such as adoption rates, production outcomes, cost-effectiveness, and use of digital tools will be collected alongside qualitative information to capture user experiences, perceptions and contextual factors influencing uptake and sustained use.

Data collection approaches will be tailored to the innovation stage and implementation context, using appropriate participatory and feedback-based methods. Innovators will be responsible for systematically collecting and documenting implementation data under the MEL framework as part of their grant obligations. Under this activity, IFAD will play a supporting and capacity-strengthening role where needed, providing guidance, standardized tools, and technical assistance to ensure data quality, methodological consistency, and alignment with the programme-level MEL framework.

Activity 2.1.3) *Develop knowledge products from evidence*

This activity will develop structured and actionable knowledge products that translate data and evidence generated from Component 1 grants into accessible formats for decision makers and scaling partners. These products will be informed by aggregated and quality-assured data, with a focus on identifying patterns, success factors, enabling conditions and challenges encountered across innovations. The resulting outputs will support strategic decisions and facilitate the scaling of proven solutions.

Findings will be synthesized into a range of knowledge products—including learning briefs, case studies and guidance notes—which distil practical insights for replication, investment and policy engagement. Each product will document key lessons and strategies for the inclusive and responsible adoption of innovations, highlighting approaches that are gender-responsive, socially inclusive, and locally adapted. By emphasizing equity considerations and cultural relevance, these products will provide systematized, cross-context insights that inform decision-making at national, regional and global levels.

Subcomponent 2.2: Knowledge systematization and dissemination through peer-to-peer platforms and SSTC for learning and scaling

Output 2.2: Successful innovations and practices are systematized, documented, and shared at the National, Inter-regional and local levels to increase adoption and uptake at scale through peer-to-peer learning platforms and SSTC.

This output focuses on the transition from local innovation knowledge to national and regional scaling by leveraging robust peer-to-peer learning platforms that facilitate horizontal knowledge exchange among smallholders, innovators, and local institutions at sub-national levels. By strengthening these community-level networks, the programme fosters inclusive social learning and ensures that women, youth, and Indigenous Peoples are active participants.

This localized engagement reduces the perceived risks of new technologies and builds the necessary local ownership and evidence base required for broader uptake. These platforms serve as the primary engine for identifying which practices are most effective and socially inclusive for adoption at scale. This ensures that the human element of adaptation is captured before innovations are systematized for wider dissemination.

Once proven at the local level, successful practices are transformed into systematized knowledge products designed to inform policy and strategic investment at national and inter-regional levels. By linking knowledge products to SSTC initiatives. This enables governments, IFAD country teams, and regional partners to access actionable insights on what works, for whom, and at what cost.

Knowledge dissemination activities are designed to not only share information, but to influence adoption decisions by reducing risk, shifting incentives and addressing institutional constraints. Peer-to-peer platforms and SSTC engagements will therefore focus on enabling decision-makers to assess operational feasibility, financing requirements and institutional implications of innovations rather than solely promoting awareness.

This structured approach to knowledge sharing aims to accelerate the adoption of gender-responsive climate innovations across borders. Ultimately, by bridging the gap between community-level success and international platforms, the programme will generate the public and private trust necessary to scale solutions that strengthen the resilience of smallholder agriculture.

Activity 2.2.1) Community-level, peer-to-peer platforms are leveraged and strengthened

This activity will leverage and strengthen local networks and platforms that bring together farmers, producer organizations, innovators, researchers, extension services, local authorities, and other relevant actors. The project will directly support the inclusion of knowledge from Components 1 and 2 (Output 2.1) to assist rural communities in jointly identifying challenges and exchanging knowledge related to innovations developed under Component 1 and 2 that provide solutions to these challenges.

Interventions under these platforms will explicitly prioritize the meaningful participation of women, youth, Indigenous Peoples, and other marginalized groups. This will be achieved through targeted facilitation methods, women-only or youth-focused sessions where appropriate, and the use of culturally appropriate and accessible communication tools. These platforms will promote co-learning, enabling innovations to be adapted to local agroecological, socio-economic, and cultural contexts, rather than being transferred as one-size-fits-all solutions.

Leveraging existing local institutions, such as farmer organizations, extension services, and community groups, rather than creating new entities, will increase legitimacy, ownership, and sustainability beyond the life of the project. Through peer-to-peer exchange, demonstration, and collective reflection, these platforms will help build trust in new solutions, reduce uncertainty though trusted peer validation, strengthen community agency in decision making, and create an enabling environment for sustained and inclusive innovation uptake.

Activity 2.2.2) *Facilitate South–South cooperation and policy engagement for scaling of innovations*

The programme will facilitate national, regional, and inter-regional dialogue through SSTC. This activity will focus on exchange between countries and institutions. Learning workshops, virtual exchanges and communities of practice will be convened through IFAD's SSTC platforms to enable policymakers, IFAD country teams, practitioners and innovators to share experiences, successes and challenges on climate adaptation innovations, with a focus on those that are gender-responsive, socially inclusive, and locally adapted.

Engagements will emphasize replication pathways, enabling policy and institutional conditions, and investment requirements, drawing on synthesized evidence and knowledge. Systematized knowledge will be used to inform national adaptation planning, agricultural investment frameworks and climate finance strategies, supporting coordinated scaling and the crowding-in of public and private investment.

Component 3: Scaling and Replication across IFAD Programme of Loans and Grants (PoLG)

Outcome 3: Viable innovative adaptation technologies and practices are scaled and replicated into national-scale investment projects under IFAD's PoLG

This component will support the systematic scaling and replication of climate adaptation innovations that demonstrate strong evidence of effectiveness, inclusiveness, and scalability under Components 1 and 2. The objective is to accelerate adoption and uptake of proven innovations through IFAD's PoLG by embedding them within country-level investment projects and national delivery systems, directly contributing to Adaptation Fund's Expected Result 2: successful innovations replicated and scaled up.

By absorbing early innovation risk during piloting through grant financing, AFCIA enables testing and validation of promising solutions before larger-scale investments are committed. Risk sharing follows a staged approach: AFCIA grants support early experimentation and adaptation, while PoLG investments and public resources finance expansion once effectiveness and operational feasibility are demonstrated. Investment decisions are expected when innovations meet defined scale-readiness criteria, align with national priorities, and demonstrate viability within existing institutional systems. Adoption of innovations at scale through IFAD PoLG will occur when IFAD country teams, governments and implementing partners recognize the value and agree to integrate innovations into relevant national programmes. At this stage, financing may be mobilized through integration in IFAD PoLG, or partnerships with private-sector actors engaged in agricultural value chains.

Therefore, the programme supports the conditions for these decisions by providing validated evidence, operational guidance and risk-reduction mechanisms aligned with national priorities and IFAD investment cycles. Adoption risks will be reduced through targeted technical assistance, grant-based support to cover early integration and adaptation costs, and sustained engagement with governments and implementing partners to facilitate incorporation of innovations into investment programmes.

The component builds on the premise that scaling is not a linear expansion of pilots, but a deliberate, evidence-driven process that requires early alignment with country priorities, institutional capacities, and investment cycles. Accordingly, scaling pathways will be identified through close coordination with IFAD country teams, government counterparts, and implementing partners.

Innovations may follow different trajectories, including integration into PoLG, replication through national programmes, continued piloting, or strategic discontinuation where evidence indicates limited scalability. Success throughout the programme will therefore be measured not only in terms of the number of innovations reaching scale, but also by the quality of learning generated and the establishment of viable institutional pathways for adoption.

Sub-component 3.1 Scale-readiness assessment and PoLG alignment

Output 3.1: Clear, evidence-based criteria for scaling are defined, and suitable IFAD projects are identified to mainstream successful innovations

This output establishes the foundation for responsible and effective scaling of climate adaptation innovations. Drawing on evidence and knowledge generated under Components 1 and 2, clear, transparent, and practical criteria will be developed to assess the scale-readiness of innovations, including technical performance, cost-effectiveness, gender responsiveness, environmental sustainability, institutional fit, and alignment with national priorities. Innovations that meet clearly defined scale-readiness thresholds will be considered for integration into IFAD-financed investment projects. The output also identifies suitable entry points within IFAD's PoLG to integrate proven innovations into country-level investment projects, ensuring alignment with national policies, Country Strategic Opportunities Programme (COSOP) priorities, and institutional capacities. Scaling decisions will follow a stage-gated process aligned with IFAD's project cycle. Each innovation will progress through clearly defined "decision gates" supported by evidence generated under components 1 and 2. Advancement between stages will require documented review and endorsement by the programme delivery team, relevant IFAD country teams and ultimately government endorsement for inclusion and scaling through national programmes.

Activity 3.1.1) *Develop scale readiness criteria for innovations*

To determine which innovations are suitable for scaling, a set of clear and transparent scale-readiness criteria will be developed using evidence and knowledge generated under Components 1 and 2. The criteria will assess the areas outlined above through structured analysis of grant-level evidence, synthesis of lessons learned, and consultations with technical specialists, innovation teams, and country-level stakeholders. The activity will produce a robust framework that can be applied consistently to all candidate innovations, guiding selection and early-stage adaptation for scaling.

The scale-readiness criteria will function as a formal decision-making tool rather than only an analytical exercise. Innovations will be assessed using standardized scorecards covering aspects such as:

- Adaptation effectiveness and resilience outcomes
- Farmer adoption and user acceptance
- Gender equality and social inclusion performance
- Cost-effectiveness and financial sustainability
- Institutional feasibility within national systems
- Compliance with social and environmental safeguards

Innovations demonstrating credible performance evidence may be classified into three pathways: 1) scale-ready innovations that can advance to PoLG integration, 2) adaptation/refinement innovations that can continue piloting with adjustments, and 3) learning innovations that will be documented for knowledge and learning but not pursued for scaling. This mechanism explicitly acknowledges that not all innovations are expected to scale, while ensuring transparent and accountable decision-making.

Activity 3.1.2) *Map innovations to IFAD projects and entry points*

A dynamic mapping exercise will be conducted to link prioritized innovations to potential IFAD investment projects. This process will begin in the early stages of project implementation and will be institutionalized through structured engagement with IFAD country teams, government counterparts, and other implementing partners.

Early engagement ensures that programme funding is directed toward the most relevant thematic areas and identifies innovations with genuine potential for scaling, while recognizing that not all innovations will reach full scale. The mapping will involve compiling a repository of IFAD projects that are ongoing or in the pipeline, identifying thematic and sectoral entry points, and assessing alignment with project objectives, institutional capacities, and country priorities. Insights gained from this mapping will inform innovation selection, guide early design adjustments, and establish potential scaling pathways, ensuring that resources are invested efficiently and strategically. Where potential entry points are identified, during the project concept and design phases, the AFCIA programme delivery team together with a representative from the country team will assess the feasibility of inclusion, budget implications, institutional readiness and implementation risks. Innovations endorsed at this stage will be registered as PoLG integration candidates.

Sub-component 3.2 Technical integration and scaling support

Output 3.2: Targeted technical assistance is provided to IFAD's PoLG to ensure effective integration of proven innovations into their country-level investment projects at design.

This output supports the translation of proven innovations into scalable models and design inputs that can be embedded within IFAD-financed projects and national delivery systems. Technical assistance will ensure innovations are mainstreamed in ways that retain gender responsiveness, social inclusion, and environmental safeguards. By providing structured guidance and "scaling packages," the output facilitates practical, context-specific adoption and strengthens national ownership and sustainability.

Activity 3.2.1) *Develop scaling packages for prioritized innovations*

For each PoLG integration candidate innovation identified as scale-ready, a comprehensive scaling package will be prepared. This package will consolidate evidence from Components 1 and 2, practical implementation guidelines, delivery and business models, institutional integration pathways, and policy-relevant insights. The process will involve reviewing grant-level performance data, documenting lessons on adoption, cost, and operational feasibility, and translating these insights into clear, actionable guidance for project designers and national partners. The scaling packages will serve as ready-to-use tools, enabling teams to integrate innovations efficiently while maintaining their effectiveness, inclusiveness, and sustainability. The development of the packages will align with IFAD project design cycles.

Activity 3.2.2) *Provide targeted technical assistance to IFAD country teams and national extension partners*

Targeted support will be provided to IFAD country teams and national extension agents during project design formulation. This assistance will focus on identifying concrete entry points for integrating innovations within project components, budgets, results frameworks, and implementation arrangements, adapting them to local agroecological, socio-economic, and institutional contexts. The activity will ensure that gender, social inclusion, and environmental safeguards are retained as innovations are scaled.

Close coordination with government agencies, research institutions, extension services, farmer organizations, and private-sector partners will facilitate embedding innovations into existing systems, strengthening national ownership, enhancing institutional sustainability, and enabling innovations to reach a larger number of smallholders, particularly women and vulnerable groups.

IFAD Project Design Stage	**AFCIA Scaling Support**	**Responsible Party**	**Accountability Tools & Decision Points**
Concept	-Identify scale-ready innovation candidates based on MEL evidence -Map innovations to country priorities and investment pipeline	AFCIA Programme Delivery Team & Country Team	-Innovation Scale-Readiness Criteria -Mapping tool with entry points for innovations to be integrated in IFAD investment projects *Decision Gate 1: Innovation validated as potential PoLG candidate*
Design	-Develop innovation scaling packages for candidate innovations for scaling -Provide technical assistance to country teams and national partners to integrate innovation into	AFCIA Programme Delivery Team in coordination with Project Delivery Team and following government endorsement for	-Scaling Package completed -Design mission reports documenting integration of innovation

	project components and results framework -Support costing, safeguard alignment, and delivery models	inclusion of innovation in Project Design	*Decision Gate 2: Formal endorsement of innovation inclusion in PoLG design*
Start-up	-Provide start-up technical assistance -Support training of national extension partners	AFCIA Programme Delivery Team and PMU	-Training and operational plans approved -Innovation included in Annual Work Plan & Budget (AWPB) *Decision Gate 3: Innovation operationalized*

Table 3: Process for Integration of AFCIA innovations into IFAD PoLG

Programme contribution to climate resilience

The programme strengthens climate resilience by enabling smallholder farmers, pastoralists, fisherfolks, and other rural stakeholders to anticipate, adapt to, and recover from climate-related shocks and stresses. By supporting a portfolio of micro-grant funded innovations, ranging from climate-smart crops and water management solutions to low-emission livestock systems and digital advisory platforms, farmers gain access to context-specific solutions that address their unique vulnerabilities. The combined effect of these individual innovation projects generates cumulative benefits, as lessons learned, successful practices, and locally tested technologies are shared, scaled, and adapted across communities, regions, and countries. Through targeted capacity-building, knowledge dissemination, and inclusive co-creation processes, the programme ensures innovations are locally relevant, socially inclusive, and accessible to women, youth, and marginalized groups, thereby fostering equitable adaptive capacity. By linking proven innovations to IFAD's broader PoLG, the programme amplifies its reach, embedding resilient and innovative practices within national and regional agricultural systems and driving long-term, scalable improvements in climate adaptation outcomes.

In terms of monitoring and the pathway from innovation adoption to measurable resilience gains, the programme's monitoring, evaluation and learning (MEL) system will operationalize the theory of change by linking innovation support, adoption, scaling and resilience outcomes through a structured results framework aligned with the Adaptation Fund's Results Management Framework. MEL will monitor the progression from innovation piloting, to increased access, awareness, and institutional uptake, culminating in strengthened climate resilience and food security outcomes measured through the ASAP+ indicator on the number of poor smallholder household members whose climate resilience has increased. This approach ensures a clear contribution pathway from learning and scaling activities to measurable development impact across diverse country contexts.

Multi-regional approach value added and Cost effectiveness

Implemented as a multi-regional programme, the ASAP+ Adaptation Innovation Centre generates significant added value by facilitating cross-country learning, enabling the transfer of innovations across diverse agro-ecological and socio-economic contexts, and supporting efficient scaling through IFAD's global PoLG. Outcomes that would be difficult to achieve through isolated country-level interventions. The multi-regional approach is particularly central to the second component, as it allows for the systematic aggregation of evidence across countries and subregions, highlighting patterns of success, context-specific adaptation pathways, and transferable practices. By

consolidating lessons learned and documenting innovations from multiple settings, the programme enhances the credibility, robustness, and relevance of solutions, making it easier to replicate and scale innovations efficiently. This approach also generates economies of scale: shared resources, tools, and knowledge products reduce duplication of effort, lower costs per innovation tested, and accelerate uptake by providing a consolidated evidence base for policymakers, investors, and implementing partners across regions. Ultimately, the multi-regional design strengthens both the cost-effectiveness and the long-term impact of the programme by enabling learning and replication beyond the initial pilot sites.

B. Describe how the project /programme would contribute meaningfully to the Expected Results under the Innovation Pillar (i.e. (i) New innovations and risk-taking encouraged and accelerated; (ii) Successful innovations replicated and scaled up; (iii) Access and capacities enhanced for designing and implementing innovation and; (iv) Evidence base generated and shared)

As presented above in the Objectives, the ASAP+ Adaptation Innovation Centre will target three interlinked Objectives to catalyze innovation of climate adaptation technologies and practices at farm-level and provide the relevant evidence and knowledge base to scale these innovations through IFAD's wider investments and operations. The Objectives section directly shows alignment to AFCIA Expected results areas. Specific justifications of each of the four points raised in the section heading are presented below.

(i) New innovations and risk-taking encouraged and accelerated

The programme catalyzes new technologies by financing high risk innovative grant proposals that encourage experimentation. It explicitly de-risks the piloting of technologies in new contexts through targeted financing for locally led innovators (inclusive of women, youth and Indigenous Peoples). This approach allows institutions to take on risks necessary to institutionalize solutions addressing significant climate threats to small-scale agriculture. This is reflected in Objective 1 wording and outlined in the activities under Component 1.

(ii) Successful innovations replicated and scaled up

Proven innovations are promoted through IFAD's PoLG directly under Objective 3 and Component 3, ensuring successful innovations reach larger beneficiary numbers. This directly builds of evidence from Objective and Component 2. Scaling is achieved by embedding technologies through IFAD operations into nationally led initiatives at scale and where appropriates leveraging public-private partnerships. This deliberate, evidence-driven process will include development and utilization of "scaling packages" to provide the practical guidance needed for adoption across national delivery systems.

(iii) Access and capacities enhanced for designing and implementing innovation

Component 2 strengthens innovation readiness by collating and generating relevant evidence to refine design processes and address operational risks. Simultaneously, community-level peer-to-peer platforms and tailored trainings expand practical access for women, youth, and Indigenous Peoples. These platforms build trust, strengthen local agency, and enable communities to adapt solutions to their specific agroecological and cultural contexts. Evidence generated on successful innovations is converted into knowledge products and shared through multiple platforms (leveraging existing local peer-to-peer mechanisms) that support understanding of how innovations work and function. This jointly builds trust and increases capacity for scaling innovations (facilitated by Component 3).

(iv) Evidence base generated and shared

A robust monitoring and learning framework systematically captures evidence on performance, cost-effectiveness, and user experience. This raw data is transformed into targeted knowledge products like learning briefs and case studies. Dissemination occurs via SSTC and existing local/peer-to-peer platforms. Further, knowledge is shared at national levels to inform national adaptation planning and interregional scaling efforts.

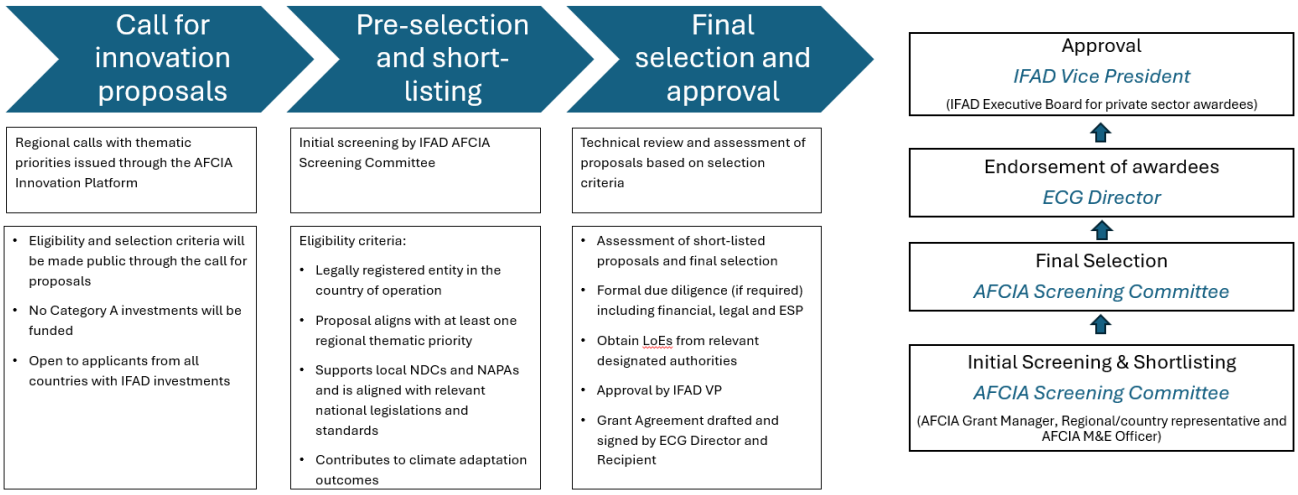
C. Describe how the project/programme will source innovation small grant proposals, and screen them for the potential to support concrete adaptation actions to assist the participating countries in addressing the adverse effects of climate change and build in climate resilience.

The programme will establish a structured, transparent and inclusive innovation grant mechanism, in line with IFAD's grant procedures, to source, screen and support grant proposals that deliver concrete climate adaptation actions and build climate resilience among small-scale farming communities in participating countries. Small grants will range from micro (US$ 75-250k) to small-scale funding, allowing the programme to support early-stage, high-risk and context-specific innovations that are often excluded from conventional financing mechanisms.

Innovation proposals will be sourced through periodic open calls for proposals issued at regional level using IFAD's established communication channels, regional networks and partnerships. Targeted outreach will be undertaken to ensure that innovation is not restricted to conventional actors or technologies. This will include dissemination through farmer organizations, Indigenous Peoples' networks, women- and youth-led organizations, research institutions, local NGOs, social enterprises and local private sector innovators, including also existing local partners that IFAD already cooperates with at national level. Outreach materials will be designed to encourage a wide spectrum of innovation types, including technological, institutional, financial, social and process-based innovations, as well as innovations that combine traditional or Indigenous knowledge with modern approaches. This inclusive approach ensures broad access to adaptation finance and fosters locally led innovation ecosystems.

The programme will apply a competitive, transparent and multi-stage screening process aligned with IFAD's grant procedures and the Adaptation Fund's innovation framework as presented in Figure 3 below. An initial screening will assess eligibility, alignment with the programme's thematic innovation windows, alignment to local Nationally Determined Contributions (NDCs) and National Adaptation Plans (NAPs), and potential contribution to tangible adaptation outcomes and resilience building. Shortlisted proposals will then undergo a technical review conducted by a multidisciplinary panel within IFAD, with expertise in climate adaptation, innovation, gender equality, Indigenous Peoples' engagement, and environmental and social safeguards.

Figure 3: Screening and selection process for innovation proposals and approval flow



Selection criteria will include, inter alia: relevance to climate change impacts and adaptation needs within the specific agroecological region or context; innovation potential and added value beyond existing practices; feasibility and appropriateness for small-scale farming systems; inclusion of women, youth and Indigenous Peoples where relevant; scalability or replication potential (with focus on the IFAD PoLG); and compliance with IFAD's Social, Environmental and Climate Assessment Procedures (SECAP) and AF standards. Table 3 below outlines the full list of the selection criteria. Clear timelines for each stage of the call, review and approval process will be defined and communicated in advance to ensure predictability and transparency.

A. Relevance and alignment	• Direct relevance to climate adaptation in smallholder agri-food systems with clear identification of climate risks to be addressed • Alignment with at least one priority innovation area[6] identified by the programme • Demonstrated alignment with national and subnational climate and development priorities including NDCs, NAPs and sectoral policies or gender policies • Geographic relevance to IFAD countries of operation and agroecological suitability • Innovation addresses structural barriers faced by women, youth, Indigenous Peoples and marginalised groups in climate adaptation
B. Target Group Focus	• Demonstrated focus on and intentional targeting of smallholders, pastoralists, fishers, women and/or youth, Indigenous Peoples with clear use cases for vulnerable groups • Evidence of demand or uptake from intended users (e.g. pilots, co-design processes, farmer feedback) • Gender analysis proportional to project size

[6] The key innovation thematics identified through the background study are the following: weather and climate information services, financial products and climate insurance, crop production and diversification innovations, value chain traceability and post-production solutions, nature-based solutions, digital solutions and traditional knowledge integration. More details can be found in Annex I.

C.	Technical feasibility and market potential	• Clear articulation of value added of innovation over existing solutions across dimensions such as climate, productivity, efficiency, inclusivity, valorization of indigenous knowledge etc. • Innovation is designed for accessibility and uptake by women and marginalised users (literacy levels, language, cost, mobility) • Assessment of commercialisation potential and regulatory environment
D.	Implementing capacity	• Relevant technical expertise and/or traditional knowledge (intended as community-based and environmentally contextualized) of implementing entity • Local presence or partnerships • Basic financial and governance capacity
E.	Social and Environmental Safeguards	• Compliance with environmental and social safeguards • No Category A investments • Avoidance of maladaptation • Synergies of adaptation and mitigation where relevant
F.	Data integrity and ethics (if applicable)	• Technological innovations comply with data protection and user consent principles

Table 4: Selection criteria for innovation proposals

Monitoring, learning and knowledge sharing

All small grants will be monitored through IFAD's through the MEL framework established and tailored to innovation, AF requirements under Component 2. This will plug into IFAD's own monitoring platforms and processes.

Grantees will be required to report on adaptation outcomes, lessons learned and innovation performance through key indicators outlined in the logframe. Learning will be treated as a core objective of the grant mechanism, with systematic documentation of successes, failures and enabling factors. Results and lessons will be synthesized into targeted knowledge products and shared through IFAD platforms and SSTC to inform future innovation cycles, replication and scaling.

Through this structured yet flexible approach, the programme ensures that innovation grants are accessible to diverse local actors selected rigorously and supported effectively to deliver concrete adaptation benefits, strengthen climate resilience and contribute to a growing evidence base on locally led climate innovation in small-scale agriculture.

D. Describe how the project / programme would screen innovation small grant proposals for their potential to provide economic, social and environmental benefits, particularly to vulnerable communities, including gender considerations, while avoiding or mitigating negative impacts, in compliance with the Environmental and Social Policy and Gender Policy of the Fund.

Innovation small-grant proposals will be screened through a structured and staged assessment process (outlined in section M and Part III below) that integrates innovation merit, development impact potential, and environmental and social risk management. All proposals will be assessed against programme-specific eligibility, exclusion, and evaluation criteria aligned with the Adaptation Fund's Environmental and Social Policy and Gender Policy, as well as IFAD's Social, Environmental and Climate Assessment Procedures (SECAP). Screening will explicitly assess potential economic,

social, and environmental benefits for vulnerable communities, including women, youth, and Indigenous Peoples, alongside potential risks and mitigation measures.

A background assessment across IFAD's five regions (Annex I) identified priority innovation areas for grant funding, including but not limited to climate information services, water and crop systems, adaptation finance, value chains, Nature-based Solutions NbS, digital services, and traditional knowledge integration.

These innovations are expected to deliver social, environmental, and economic benefits as per the below.

1. Social benefits
   a) Reduced vulnerability and increased adaptive capacity and resilience through access to weather and climate information services and locally adapted land and water management practices for farmers, pastoralists and fisherfolks allowing them to make informed decisions and manage risks
   b) Greater inclusion of women, marginalized groups and Indigenous Peoples through recognition and integration of traditional knowledge systems and practices in innovation solutions promoted and financing of innovations that are gender sensitive and promote the equitable participation of women
   c) Strengthened local institutions through funding for innovations that promote or integrate community-based resource management and support cooperatives and national/local level cooperatives and committees to improve their governance and monitoring systems
   d) Innovative adaptations that minimize effort can result in significant labour savings, allowing individuals to allocate more time to vital household livelihood activities. This is especially relevant for women and female-headed households, who often undertake a greater share of essential domestic responsibilities.

2. Environmental benefits
   a) Improved soil health and reduced land degradation through innovations focused on sustainable land management, conservation agriculture and rangeland restoration that enhance soil structure, fertility and water retention increasing the resilience of ecosystems to withstand and recover from droughts, floods and heat extremes
   b) Sustainable water use contribution to water security through innovations that focus on water-efficient irrigation, climate-informed water management and watershed-based approaches
   c) Reduced greenhouse gas emissions linked to improved livestock management practices, manure management and ecosystem restoration that generate mitigation and adaptation benefits
   d) Protection and enhancement of local biodiversity through funding of innovative nature-based solutions including mangrove restoration, agroforestry and landscape-level conservation

3. Economic benefits
   a) Increased agricultural productivity and efficiency through Precision irrigation, improved seed systems, soil and water management practices, and climate-smart livestock interventions
   b) Increased economic stability for smallholder farmers under climate stress as climate-resilient crops, improved livestock systems, and risk management tools reduce yield losses and income volatility

c) Reduced post-harvest losses and value chain inefficiencies through investments in storage, cold chains, processing, and traceability solutions that lower food losses, increase product quality, and enhance returns for smallholder producers
d) Improved access to markets, finance, and insurance as digital platforms, climate-linked finance instruments, and inclusive value-chain innovations reduce transaction costs and enable smallholders to access higher-value markets and financial services

The programme's approach to gender equality and women's empowerment aligns with IFAD's approach to gender equality and women's empowerment, the Gender Action Plan 2026-2031 and the Adaptation Fund's Gender Policy and Action Plan. Gender considerations will be integrated throughout the project cycle, including the sourcing and evaluation of small grants.

Specific GEWE criteria are embedded in the eligibility and evaluation process for micro-grants. Proposals must demonstrate how the innovation responds to the differentiated needs of women and marginalized groups and contributes to gender equality and social inclusion. Proposals that do not intentionally target IFAD's priority groups include a gender-responsive design, and outline mechanisms to monitor inclusion outcomes will not be considered (see section J).

To strengthen support to vulnerable communities, a portion of the micro-grant resources under Component 1 will be channeled through IFAD's Indigenous Peoples Assistance Facility (IPAF), which provides direct financing to Indigenous Peoples' organizations for community driven climate adaptation initiatives. IPAF's direct financing and indigenous-led structure align with the Adaptation Fund's mission to support concrete adaptation projects and foster meaningful engagement with vulnerable communities. Operating across diverse ecosystems, IPAF prioritizes projects that build resilience using traditional knowledge while promoting the empowerment of women and youth. The structure of IPAF ensures that resources are channeled directly to a broad network of Indigenous Peoples' Organizations to support innovative projects they have designed and implemented themselves, drawing on their own culture, identity, and traditional knowledge to build resilience and manage disaster and climate change risks.

All proposals will be screened against IFAD's SECAP exclusion list and risk thresholds to prevent environmental and social harm. High-risk activities or those inconsistent with the Adaptation Fund's Environmental and Social Policy will be excluded. Shortlisted proposals will undergo enhanced due diligence, including environmental and social risk categorization and, where required, the preparation of Environmental and Social Management Plans and gender action plans, ensuring risks are identified early and managed throughout implementation, in full compliance with the Fund's Environmental and Social Policy.

E. Describe or provide an analysis of the cost-effectiveness of the proposed project / programme and explain how the regional or multi-regional approach would support cost-effectiveness.

The proposed programme is designed to maximize cost-effectiveness by combining a global, multi-regional delivery model with a selective, evidence-driven approach to identifying, testing, and scaling climate-resilient innovations. By leveraging IFAD's institutional infrastructure and its US$2 billion+ annual investment portfolio for scaling, the programme ensures high Value for Money (VfM) and minimizes the transaction costs typical of fragmented adaptation efforts.

1. Programme-Level Efficiency: The Multi-Regional Advantage

- Reduced Administrative Overhead: By utilizing a globally administered grant, the programme centralizes core functions—governance, procurement, and technical quality assurance—

within IFAD's existing systems. This avoids the cost of establishing five separate regional management units and ensures a higher percentage of funds reaches the field.
- Cross-Regional Learning and South-South Cooperation: The multi-regional design enables economies of knowledge. Adaptation tools and implementation lessons from one region are systematically adapted for others. This prevents reinventing the wheel and reduces the costs associated with primary research and piloting in new geographies.
- Operational Synergies: The programme draws on IFAD's Environment, Climate, Gender and Social Inclusion (ECG) division and regional technical networks. Using these in-house resources rather than external consultants ensures high-level technical oversight while maintaining a lean budget.

2. Innovation-Level Efficiency: Strategic Selection and Scaling
- Scale-Readiness and Sustainability: Innovations are selected based on their fit within existing national extension services and farmer organizations. By avoiding the creation of parallel, project-dependent delivery structures, the programme ensures that successful pilots can be sustained and expanded using national resources post-project.
- Co-Design to Reduce Risk: By placing end-users (women, youth, and Indigenous Peoples) at the center of the design process, the programme ensures that innovations are demand-driven and affordable. This bottom-up efficiency reduces the risk of low adoption rates or the need for expensive mid-course redesigns.
- Direct Pathway to Large-Scale Investment: Component 3 explicitly links proven innovations to IFAD's PoLG. This provides a ready-made exit strategy and scaling mechanism, ensuring that the Adaptation Fund's seed investment triggers massive downstream climate financing at a very low incremental cost.

F. Describe how the project / programme is consistent with national or sub-national sustainable development strategies, adaptation planning processes, national or sub-national development plans, poverty reduction strategies, national communications and adaptation programs of action, national adaptation plans (NAPs), nationally determined contributions (NDCs), adaptation communications, and other voluntary adaptation reports, where they exist, as well as with the United Nations Framework Convention on Climate Change (UNFCCC) technology framework, and other relevant instruments.

Consistency with national strategies and adaptation frameworks is embedded in the EoI templates and selection criteria for innovation small grants, with proposals explicitly assessed for their relevance and alignment with NDCs, NAPs and NAPAs where applicable. In addition, all innovation small grants will be endorsed through formal Letters of Endorsement/Intent (LOIs) issued by the relevant designated authorities, ensuring strong country ownership and confirming alignment with national and sub-national strategies, sectoral plans and local adaptation priorities.

The programme complements Technology Needs Assessments (TNAs) and Technology Action Plans (TAPs) by providing risk-tolerant financing to develop, pilot and adapt priority adaptation technologies and practices identified through national planning processes but not yet operationalized at scale, particularly in small-scale agricultural systems. By supporting early-stage, context-specific innovation and generating evidence on effectiveness and feasibility, the programme bridges the gap between national adaptation planning and on-the-ground deployment.

It further supports national and regional pathways for adaptation technology deployment through knowledge generation, learning and replication across similar agroecological contexts, while reinforcing institutional linkages between innovators, public agencies and investment frameworks. This integrated approach is consistent with the UNFCCC Technology Framework, particularly its emphasis on innovation, implementation, enabling environments, collaboration and knowledge

sharing, and strengthens national capacities to deploy, sustain and scale climate-resilient adaptation solutions in line with national and international climate objectives.

G. Describe how the project / programme would screen innovation small grant proposals for meeting the relevant national technical standards, where applicable, in compliance with the Environmental and Social Policy of the Fund.

IFAD will ensure that all innovation small grant proposals comply with relevant national technical standards and the Environmental and Social Policy (ESP) of the Adaptation Fund. As part of the competitive selection process, the AFCIA Screening Committee will assess proposals against national regulations, sector-specific guidelines, and environmental and social safeguards, with findings systematically documented. Innovators will receive guidance to address gaps and integrate ESP requirements, ensure gender responsiveness, and social inclusion, from design through implementation. Compliance will continue to be monitored throughout the programme lifecycle via the MEL framework, and the Project Management Units (PMU) retains authority to adapt, restructure, or discontinue grants that do not meet technical or safeguard standards, ensuring accountability and risk management at the portfolio level. Further details on the management structure for this programme and engagement with country offices and national governments is provided under Part III.

H. Describe if there is duplication of project / programme with other funding sources, if any.

No duplication of funding is expected within this programme. To ensure complementarity, all innovation small grant proposals will be screened during the selection process to identify potential overlap with existing initiatives financed by IFAD or other partners. Applicants will be required to disclose any current or past funding received for similar activities or sources including support from IFAD innovation initiatives such as Innovatech and Moonshots for Development, as well as other climate or development funding sources, including other AFCIA grant mechanisms. Proposals demonstrating duplication of existing funded activities will not be eligible. Programme oversight by the AFCIA delivery team will further ensure coordination across IFAD operations. Relevant IFAD country teams and technical specialists will be consulted during proposal review and implementation to identify overlaps and ensure complementarity with ongoing programmes. This coordination will also help identify entry points for the scale up of successful innovations through IFAD programmes where appropriate.

I. Describe the learning and knowledge management system to capture and disseminate evidence, particularly of effective, efficient adaptation practices, products or technologies generated, as a basis for potential scaling up.

The Programme will establish an integrated Learning and Knowledge Management System (LKMS) designed to capture, synthesize, and disseminate evidence of effective climate adaptation innovations. To ensure cost-efficiency and minimize duplication, the LKMS is not a standalone entity but is embedded within the programme's two-tiered MEL framework. This system ensures that data generated at the individual grant level (Tier 1) is systematically transformed into actionable knowledge at the programme level (Tier 2), providing a credible basis for scaling through IFAD's Programme of Loans and Grants (Component 3).

Tier 1: Grant-Level Evidence Generation

Knowledge generation begins with the innovation grant portfolio under Component 1. All funded innovators are contractually required to produce structured evidence using standardized reporting templates and indicators. This captures not only biophysical resilience outcomes and technical

performance but also socio-economic impacts, gender-responsiveness, and financial viability. By embedding these requirements into grant agreements, the programme ensures data comparability across diverse regions. Crucially, the system values "learning from failure," documenting challenges and experimentation to foster a culture of iterative adaptation.

Tier 2: Programme-Level Synthesis and Adaptive Management

At the programme level, the LKMS aggregates results across thematic areas to identify broader patterns, success factors, and barriers to scaling. This synthesis creates a continuous feedback loop: insights from early innovation cohorts are used to refine subsequent calls for proposals and guide technical assistance. This ensures adaptive management, where the programme's strategic direction is constantly informed by real-time evidence of what works for smallholder farmers.

Inclusive Dissemination and Peer Learning

The LKMS prioritizes "innovation-readiness" by ensuring knowledge reaches end-users through existing local mechanisms. Under Component 2, community-level peer-to-peer platforms and demonstration trials enable farmers, pastoralists, women, youth, and Indigenous Peoples to share lived experiences. To promote equity, the system integrates specific gender-sensitive strategies, including women-only learning groups and culturally appropriate communication tools that accommodate varying literacy levels. Furthermore, the programme facilitates the integration of Indigenous knowledge, engaging community representatives in co-creation to ensure solutions reflect traditional resource management systems.

Global Exchange and Visibility

For wider impact, the programme leverages South–South and Triangular Cooperation (SSTC) to link proven innovations with national extension services and regional policy frameworks. Lessons generated are packaged into policy briefs and case studies to inform NAPs and NDCs. All knowledge products will be hosted on a dedicated space within the IFAD website, serving as a central repository for the Adaptation Fund, partner institutions, and the private sector. This comprehensive approach ensures that evidence of effective adaptation is not only captured but is actively positioned to crowd-in the public and private investment required for global scaling.

J. Describe the consultative process that would take place, and how it will involve all key stakeholders, and vulnerable groups, including gender considerations.

During the project design phase, intra- and inter-divisional consultations were conducted within IFAD engaging the Programme Development Team (PDT), regional specialists, and thematic experts on climate, gender, Indigenous Peoples, livestock, fisheries, agroecology and ICT. These consultations helped integrate regional perspectives, identify and priority climate adaptation areas, and align the consultation approach and mechanisms for on-granting. These consultations also helped validate the outputs of the background study, align innovation priorities with IFAD's operations on the ground and identify potential local partners for engagement in subsequent consultations (see Annex 2 for the consultation plan and stakeholders engaged).

External consultations were held targeting regional stakeholders, farmers' organizations, Indigenous Peoples' representatives, research institutions, development partners, and relevant ministries in thematic working groups and roundtables. These discussions informed a co-design of the technical parameters of the Innovation Grant Window, identifying synergies with ongoing initiatives, and deliberately including representatives of women's organizations, youth groups, and Indigenous communities to ensure the perspectives of vulnerable and marginalized groups informed project priorities and design. Participation ensured at least one female representative per stakeholder group

and active facilitation supported meaningful engagement. This ensured that innovations promoted are inclusive, locally appropriate, and responsive to the needs of diverse smallholder communities.

During the implementation phase, the programme will maintain engagement through the launch of the Innovation Centre, regional awareness sessions, annual dialogues, mid-term workshops, and South–South knowledge exchanges that are planned under Component 2. At the community level, peer-to-peer learning platforms under Component 2 will be established or strengthened to ensure active participation of smallholder farmers, women, youth, Indigenous Peoples, and other marginalized groups. These platforms will provide accessible spaces for co-creation, knowledge exchange, and iterative feedback on innovations, enabling vulnerable groups to influence adaptation solutions, build skills, and enhance adoption.

Knowledge sharing and policy engagement where feasible will be embedded throughout implementation, with results disseminated through global workshops, case studies, and policy briefs targeting ministries, development partners, IFAD project teams, and regional networks.

Programme approach to gender equality and women's empowerment

The project adopts a systematic approach to gender equality and women's empowerment (GEWE), recognizing that climate risks, adaptive capacities, access to resources, and innovation uptake are highly gender-differentiated in rural contexts. Women smallholder farmers, pastoralists, and Indigenous women often face structural barriers related to land tenure, access to finance, information, technologies, markets, and decision-making spaces. Addressing these constraints is essential for equitable climate adaptation outcomes.

The approach is fully aligned with IFAD's Policy on Gender Equality and Women's Empowerment and Gender Action Plan (2026–2031), as well as the Adaptation Fund's Gender Policy and Action Plan, and integrates GEWE across all three components of the project through binding design requirements, implementation mechanisms, capacity development, and monitoring and accountability systems.

Component 1

Gender equality is embedded at the earliest stages of the innovation cycle. A minimum threshold of 50 per cent of supported innovations will apply a gender lens to strengthen inclusive adaptation outcomes. The programme will also actively encourage proposals from women-led enterprises, cooperatives, and innovation initiatives, including those led by Indigenous women.

All innovation proposals are required to conduct a targeting and gender assessment at the pre-selection stage and prior to contracting, identifying differentiated climate risks, barriers to access and adoption, and pathways to ensure equitable benefits for women and other marginalized groups. Proposals that do not demonstrate intentional targeting of IFAD's priority groups or a gender-responsive design will not be eligible for funding.

For innovations at the field-pilot demonstration stage or higher levels of maturity, applicants must demonstrate evidence of demand and uptake among intended users, including women, and provide evidence of co-creation processes and farmer feedback mechanisms, to ensure that innovations reflect the needs and priorities of women and other marginalized groups.

Component 2

Component 2 addresses structural and information barriers that often limit women's ability to adopt climate adaptation innovations. Multi-stakeholder innovation platforms will bring together farmers (including women farmers), researchers, innovators, policymakers, extension services, and civil society to support inclusive learning and co-creation processes. Community-level peer-to-peer learning platforms will enable smallholder farmers, particularly women to share experiences, access practical information on innovations and provide feedback on their performance and relevance in different local contexts. These platforms will support the dissemination of innovation insights and lessons learned, helping ensure that women farmers and other marginalized groups can access and benefit from adaptation knowledge. They will also reinforce women's participation and leadership in adaptation processes, helping reduce perceived risks of adoption and strengthen local ownership of innovation pathways.

Component 3
Gender considerations will inform decisions on scaling and mainstreaming innovations through IFAD's PoLG. Scale-readiness criteria will assess whether innovations deliver equitable benefits, address women's constraints, and demonstrate inclusive adoption pathways.

Targeted technical assistance will support IFAD country teams to integrate gender-responsive innovations into country-level investment projects, including guidance on inclusive implementation arrangements and gender-responsive monitoring.

K. Describe how the project/programme draws on multiple perspectives on innovation from e.g., communities that are vulnerable to climate change, research organizations, or other partners in the innovation space, in the context in which the project/programme would take place.

The programme adopts an inclusive and multi-dimensional approach to innovation that draws on perspectives from climate-vulnerable communities, Indigenous Peoples, women and youth, alongside research organizations, public institutions and private sector actors. Building on IFAD's experience under the ASAP fund, which has a long track record of financing and supporting climate adaptation innovation in small-scale agriculture, the programme recognizes innovation as not only technological, but also social, institutional and financial, rooted in local knowledge and adapted to specific agroecological and socio-economic contexts.

The project design, thematic focus areas and innovation selection criteria have been informed by consultations with relevant stakeholders (see above), ensuring that the programme reflects diverse perspectives and responds to real adaptation needs.

Participatory and co-creation approaches will ensure that innovations respond to locally identified climate risks, while partnerships with research institutions and technical organizations will strengthen evidence, learning and adaptation of solutions. Together with targeted capacity building, mentoring and knowledge exchange under Component 2, and by leveraging existing knowledge-sharing platforms and technical networks, the programme will strengthen innovation ecosystems and build innovation readiness. Further, Component 3 will support the sustainability and scale-up of climate adaptation innovations beyond the programme duration.

L. Provide justification for funding requested, focusing on the full cost of adaptation reasoning.

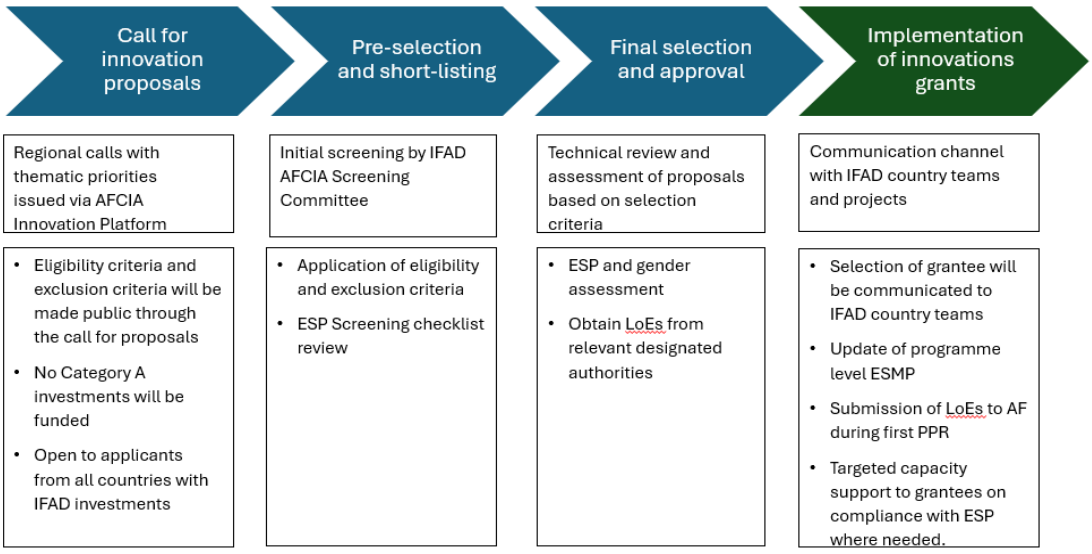
The funding requested under this programme represents the full cost of adaptation required to de-risk, test and validate innovative and experimental climate adaptation technologies and approaches

in small-scale agricultural systems, in line with the Adaptation Fund's mandate. Co-financing will not be applied under grants and budgets will be expected to cover the full cost of interventions.

The innovations targeted are inherently high-risk, early-stage or context-specific. These grants would not be financed through conventional public budgets or commercial sources due to the nature of this risk, this will be highlighted in Expressions of Interest (EOIs). AFCIA financing will cover upfront risks associated with experimentation in real-world field conditions, generate evidence of adaptation effectiveness, and enable innovation in contexts where climate vulnerability, institutional constraints and market failures are most acute. Without these grants innovations selected would not be financed. AFCIA resources therefore provide 100 per cent climate finance additionality.

Sustainability considerations are embedded throughout programme design and in the screening of innovation small grants. Proposals will be assessed not only on climate relevance and adaptation outcomes, but also on their potential for longer-term viability, uptake and replication, including institutional ownership, affordability, alignment with national priorities and feasibility for scaling. Understanding financial and economic outcomes of the grants are crucial. This will support the development of business cases for each successful innovation. This enables subsequent engagement with local private sector actors, financial institutions and implementation partners, lowering barriers to partnership formation and increasing the likelihood that successful solutions can transition beyond grant support.

Clear and structured pathways to scale are built into the programme architecture. Under Component 3, successful and promising innovations will be systematically identified and supported for scaling and replication through IFAD's PoLG, including integration into country-led investment programmes under IFAD's Fourteenth Replenishment (IFAD14) cycle. This provides a direct institutional pathway



for proven innovations to move from experimentation to national-scale implementation, leveraging IFAD's sovereign and non-sovereign financing instruments and operational infrastructure.

In parallel, Component 2 will ensure that evidence, lessons learned and success factors from innovation grants are systematically captured and shared through IFAD's knowledge management systems and SSTC platforms. Cross-regional knowledge exchange will facilitate the diffusion and adaptation of successful technologies and practices across similar agroecological and institutional contexts, accelerating uptake and replication beyond the original grant locations. This knowledge-

driven scaling complements financial scaling through PoLG and strengthens regional and global innovation ecosystems.

M. Provide an overview of the environmental and social impact and risk screening process that will be put in place for the subgrant project.

1) Risk screening process for sub-grants

The AFCIA programme will apply a robust environmental and social impact and risk screening process for all subgrant projects, in line with IFAD's Social, Environmental and Climate Assessment Procedures (SECAP) and the Adaptation Fund's Environmental and Social Policy (ESP) and Gender Policy. This approach ensures that prospective micro-grant recipients have the institutional capacity, systems, and commitment to manage environmental and social risks responsibly throughout the project cycle. All grant recipients will be required to complete a self-certification of eligibility confirming adherence to IFAD's policies, procedures, and legal requirements. Environmental and social safeguards are embedded throughout the call for proposals, selection, and implementation of subgrants as shown in Figure 4 below.

At the sourcing stage, programme-specific selection and exclusion criteria are applied to ensure that proposed innovations are aligned with the AFCIA objectives, comply with AF and IFAD safeguard requirements, and avoid activities with potentially significant or irreversible environmental or social impacts. These criteria ensure that funded innovations remain focused on IFAD's core target groups, smallholder farmers, including women, youth, and Indigenous Peoples, and respond to the lived realities of vulnerable rural populations facing climate risks such as droughts, floods, land degradation, biodiversity loss, and changing agroecological conditions. Innovations supported under the programme are expected to contribute positively to resilience while safeguarding natural resources and social systems that underpin sustainable and adaptive livelihoods.

All funding requests will be screened against IFAD's SECAP risk thresholds and exclusion list, and no activities included in the SECAP Exclusion List[7] or classified as Category A will be eligible for funding. In parallel, proposals will be assessed against the 15 principles of the Adaptation Fund's Environmental and Social Policy to identify potential environmental and social risks and determine the level of risk associated with each sub-project. A dedicated Environmental and Social Safeguards Specialist within the Programme Management Unit (PMU) will oversee this process, providing technical guidance, quality assurance, and coordination of safeguards compliance from design through implementation and completion.

At the pre-selection and short-listing stage, all expressions of interest will be screened using eligibility and exclusion criteria to disqualify proposals that do not meet minimum requirements or pose unacceptable risks. A standardized screening checklist (included in Annex 4) aligned with AF ESP and IFAD SECAP will be applied to determine the environmental and social risk category. Only proposals meeting safeguard requirements will be shortlisted and assessed against pre-established evaluation criteria, including climate adaptation impact potential, inclusiveness and equity, economic viability, scalability, innovation maturity and learning value, and system-level partnerships.

[7] Available in Annex 5 here: Social, Environmental and Climate Assessment Procedures Volume 1

At the final selection stage, shortlisted applicants will undergo enhanced due diligence covering fiduciary, environmental, social, and gender aspects. Selected grantees will be required to provide mitigation measures and monitoring protocols for identified risks and show how gender considerations are embedded in innovation considerations, prior to grant approval. IFAD will provide targeted capacity-building support to grantees to strengthen their ability to identify, manage, and monitor environmental and social risks, including guidance on stakeholder engagement, grievance redress mechanisms, safeguards reporting, and implementation of mitigation measures.

During implementation, IFAD will retain oversight responsibility for safeguards compliance through regular supervision, progress reporting, and spot checks, ensuring that corrective actions are taken where necessary. Safeguard information from all sub-projects will be consolidated within the programme-level Environmental and Social Management System (ESMS), enabling systematic monitoring of risks, mitigation measures, and avoidance of potential maladaptation across the innovation portfolio (See Annex 3).

2) Programme-level Risk Screening

The project has been screened against the Adaptation Fund's fifteen Environmental and Social Principles and has been classified as Medium Risk (Category B). This classification reflects that the specific subgrant activities are not yet identified and may entail potential environmental and social impacts (refer to Annex 3 section 4). The medium-risk designation is mitigated by the robust selection criteria for subgrants, as outlined above, and by the ESP risk screening mechanism established for the programme. Proposed subgrant activities will undergo systematic assessment, and appropriate mitigation measures will be applied to ensure that any risks are identified early, localized and managed throughout implementation with appropriate mitigation measures.

At this stage, the specific activities and geographic locations of sub-projects cannot be identified, as these will be determined through the competitive sourcing and selection of innovation grants. Therefore, at these stage the innovation grants constitute unidentified sub-projects and the necessary process and risk-mitigation measures have been put in place to screen and assess sub-projects during implementation. Accordingly, the environmental and social risk category applicable to each innovation or sub-project will be assessed during the selection process in accordance with the screening and due diligence procedures described above. The risk screening presented here and in Annex 3 is therefore conducted at the programme level, reflecting the nature, scope, and safeguards provisions of the AFCIA programme as implemented by IFAD.

The table below summarizes the anticipated environmental and social impacts and risks associated with the programme, along with corresponding mitigation measures. Further assessments for compliance with each Principle will be carried out during implementation as needed upon identification of the sub-projects and following ESP screenings at sub-project level. Additional details on the risk screening process, the application of IFAD's SECAP screening tools, and the mitigation measures to be applied at the sub-project level are provided in Annex 3.An Environmental and Social Management Plan (ESMP) is included in Annex 3 and a Grievance Mechanism is outlined in Part III, Section C on Environmental and Social Risk Management, as required by the AF and IFAD procedures. At the programme level, the ESMP provides mechanisms for tracking identified risks, or any new risks, ensuring they are properly monitored, evaluated, reported on, and addressed. The

ESMP will be revised following selection of small-grants based on the risk screening for USPs and will be regularly reviewed and revised throughout the implementation of the programme.

Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
Compliance with the Law	x	**Low/No risk**: The project will comply will all relevant national policies, laws and regulations. As a UN entity, IFAD abides by international and national laws. At the preselection stage of the sub-grants an ESMP will be conducted outlining in part how the project will comply will relevant regulations. Moreover, in terms of the screening and selection of sub-grantees IFAD's financial and procurement due diligence processes are designed to ensure that selected recipients have the capacity to manage funds and execute activities in accordance with IFAD standards and national laws. At the pre-selection stage, IFAD will also seek a letter of endorsement from the relevant government ensuring that relevant ministries are informed and have no objections. During project implementation, the PDT will also facilitate linkages and consultations with relevant IFAD country offices and project management units helping also ensure that the projects/innovations funded remain aligned to IFAD and national regulations throughout the implementation phase.
Access and Equity		**Low Risk/No risk:** The project is explicitly designed to benefit smallholder farmers and rural communities, setting also clear targeting criteria as part of the eligibility criteria for the selection of sub-projects to ensure that innovations funded are responding to the needs of IFAD's target group, smallholder farmers, women, youth and vulnerable and marginalized communities. A minimum 50 per cent threshold has been set for sub-projects to be designed in a way that directly responds to women's differentiated needs, barriers and priorities. The gender action plan developed for the programme will also help in promoting access, equity and inclusion. The programme will also channel half of the funds for innovations through IFAD's Indigenous Peoples Assistance Facility to fund innovations that are developed by and for Indigenous Peoples ensuring that IPs can obtain fair and equitable benefits and opportunities from supported innovations. Inclusive consultations will also take place during the implementation of sub-projects involving potential project beneficiaries and target users for the innovations funded, ensuring that any barriers to access and equity are identified and overcome. Under component 2 of the project, activities will also focus on strengthening knowledge, awareness and learning amongst target groups in areas relevant to innovations being funded, such as digital and financial literacy, natural resource management and others addressing critical gaps for the uptake of innovations and ensuring that target groups are ready to benefit from the innovations.

Marginalized and Vulnerable Groups		**No risk:** The project has a clear target group that is smallholder farmers that are particularly vulnerable to the impacts of climate change. There will be specific focus on vulnerable and marginalized groups such as women, youth and Indigenous Peoples with clear eligibility criteria for the selection of sub projects and the allocation of funding. Component 2 will focus on ensuring that innovations are accessible and trusted by target users. Innovations often fail to reach or benefit women, youth, IPs and other vulnerable groups, not because the technologies are unavailable, but because delivery channels, information, or knowledge do not align with literacy, language, mobility, time constraints or local decision-making structures. Activities under Component 2 will support peer-to-peer learning, information exchange and structured feedback processes to ensure that target users can engage with innovations, share experiences, and influence adaptation solutions. As part of the eligibility criteria for screening innovation proposals, innovators will need to demonstrate that the solutions proposed reflect user needs and realities and for solutions beyond the research stage they will need to show evidence of demand or uptake from target users and processes for farmer feedback.
Human Rights		**No risk:** The project will international and national human rights standards, prioritizing the well-being, dignity, and rights of all stakeholders, including vulnerable groups like smallholder farmers, women, and youth in line with Principle 4: Human Rights, as outlined in the AF ESP. ESMP monitoring at the sub-project will make sure that USPs comply with the Universal Declaration of Human Rights (UDHR) throughout implementation. IFAD Due Diligence and requirements for grantees mandate compliance with high ethical standards including the UN Guiding Principles on Business and Human Rights. The grievance mechanism of the project will provide a platform for raising and addressing any concerns ensuring that no group is marginalized or excluded from benefits of sub-projects.
Gender Equity and Women's Empowerment		**Low Risk:** The programme design adheres to IFAD guiding principle on addressing gender-based violence and discrimination, and promoting gender equality, the Fund's Gender Policy and Action Plan as well as the AF's Gender Policy. However, there is a potential risk of low involvement of women in the piloting/demonstration phase of innovations. Specific considerations have been integrated in the design at the programmatic level and the sub-project level for the sourcing and implementation of small-grants to ensure that innovations funded do not reinforce existing unequal gender norms and that they take steps to ensure equitable access and benefits for women. Some of these considerations are outlined below: Minimum threshold of 50 per cent for the sourcing of innovations that adopt a gender lense to fostering resilience and inclusive adaptation outcomes, while the project will also encourage proposals from women-led enterprises. - All innovation proposals need to conduct a targeting and gender assessment at the preselection stage and prior to contracting.

		- For innovation proposals at the field-pilot demonstration level and higher in terms of maturity, they need to demonstrate evidence of demand and uptake from intended users including women. - For innovation proposals at the field-pilot demonstration level and higher in terms of maturity, they need to demonstrate a co-creation pathway and farmer feedback loops with specific attention to inclusion of women. - At the programmatic level, IFAD will facilitate the co-creation process and sensitize both innovators and intended users on pathways for participatory design and learning through the creation of multi-stakeholder innovation platforms bringing together farmers, researchers, policymakers, and innovators to co-create and share innovative solutions. - At the sub-project and programmatic level, the monitoring and evaluation system will collect gender-disaggregated data on project activities.
Core Labour Rights		**No risk:** The project is not anticipated to violate core labour rights, as it will adhere to national labour laws and international standards. Regular monitoring will be conducted to ensure compliance with labour rights throughout project implementation. The IFAD due diligence conducted prior to the signing of a grant agreement with the grantees will identify any potential issues including labour rights and standards and upon signature the grantees must adhere to core labour rights.
Indigenous Peoples		**Low Risk:** Even though the specific project locations of USPs have not been identified yet, the project has created preconditions for the specific targeting of and benefits for Indigenous Peoples by channeling funds for innovations through IFAD's Indigenous Peoples Assistance Facility. Therefore, given that the project will target innovations with a specific focus on Indigenous Peoples or ethnic minorities, their active and meaningful participation and engagement in consultations will be sought and Free, Prior and Informed Consent (FPIC) will be obtained. IPAF finances projects that foster indigenous peoples self-driven development and has an established mechanism for the selection of projects with eligibility criteria against which proposals are assessed including the requirement for grantees to be an indigenous or tribal peoples' community or organization or a not-for-profit/non-governmental organization designated to act on its behalf and to submit evidence of FPIC by the indigenous peoples' community/ies benefiting from the project.
Involuntary Resettlement		**No risk:** Project activities will not lead to any resettlement, involuntary or otherwise in physical or economic terms given the small size of the sub-projects. In the unlikely chance that any innovation proposals involve potential resettlement these will not be funded.
Protection of Natural Habitats		**Low/No risk:** The project will not have any adverse impacts on natural habitats and critical habitats will be excluded from the target zones of sub-projects for which the specific locations are not yet identified. IFAD's SECAP Standard 1 on Biodiversity conservation requires the identification of habitat type and applies increasingly stringent requirements based on an areas' biodiversity values. In the event that innovation proposals are: - Located in modified, or natural habitats; - Located in areas providing ecosystem services upon which project stakeholders;

		depend for survival, sustenance, livelihoods or primary income, or that are used for sustaining the project; - Using and commercializing an indigenous knowledge system; -Potentially affecting the access to or use of biodiversity, ecosystem services or living natural resources for communities including indigenous peoples. Then, relevant studies and impact assessment will be undertaken to assess the level of risk and appropriate mitigation measures will be put in place describing conservation outcomes, implementation, monitoring and evaluation depending on the habitat type and taking into account the importance of the biodiversity and ecosystems in the areas where the innovation will be piloted/scaled. This includes consultations with the communities and other stakeholders of the protected area.
Conservation of Biological Diversity		**Low Risk/No risk:** The project will adhere with AF ESP and IFAD SECAP which are designed to (i) maintain and conserve biodiversity; (ii) preserve the integrity of ecosystems; (iii) maintain and enhance the benefits of ecosystem services; (iv) adopt the use of a precautionary approach to biodiversity conservation and ensure opportunities for environmentally sustainable development; (v) ensure the fair and equitable sharing of the benefits from the utilization of genetic resources; and (vi) respect, preserve, and maintain knowledge, innovations and practices of indigenous peoples, and local communities relevant to the conservation and sustainable use of biodiversity and their customary use of biological resources. During the sourcing of innovations and before approval of funding, required environmental assessments will be conducted that any potential direct or indirect impacts on biodiversity, ecosystems and ecosystem services are identified at the outset and appropriate mitigation measures are integrated in the project level ESMP to avoid or minimize these impacts and any further studies that may be needed are budgeted for.
Climate Change		**Low Risk:** The project has the overarching objective of strengthening the climate resilience of targeted beneficiaries by supporting the development, piloting and adoption of climate-responsive innovations that enhance productivity, livelihoods and food security under increasing climate variability, shocks and extremes. All supported innovations will be designed to contribute to climate adaptation outcomes and to avoid practices that could increase long-term climate vulnerability. However, there is a risk of maladaptation, if innovations are not context-specific and do not address the lived realities of their target users. This risk will be mitigated through targeted design, screening and adaptive management measures at the level of the USPs, including: - Climate-risk informed design: Innovations will be selected based on their alignment with local climate risks, agroecological conditions, and national climate priorities (e.g. NDCs, NAPs), ensuring context-appropriate solutions that do not exacerbate exposure or sensitivity to climate hazards. - Systematic screening for maladaptation risks: Proposed innovations will be assessed for potential maladaptive outcomes, such as increased water stress, environmental degradation, inequitable access, or dependency on climate-sensitive inputs prior to funding approval. - Stakeholder engagement and participatory design: Regular consultations with farmers,

		pastoralists, fishers, women, Indigenous Peoples, and local institutions will be embedded throughout the innovation cycle to ensure solutions reflect local knowledge, needs, and risk perceptions, and to identify unintended consequences early. - Phased and learning-oriented implementation: The programme's emphasis on piloting and adaptive learning will allow innovations to be tested, monitored, and adjusted before scaling, reducing the likelihood of lock-in to maladaptive pathways. - Monitoring and feedback mechanisms: Regular monitoring of climate, environmental, and social outcomes will enable timely course correction if emerging risks of maladaptation are identified.
Pollution Prevention and Resource Efficiency	x	**Low/No Risk:** The project does not anticipate any risks related to pollution due to the nature of the small innovation grants to be funded focusing on areas such as climate information and agro met services, insurance solutions, crop diversification and sustainable production systems, value-chain digitalization, and nature-based solutions. Innovations focusing on low emission management systems may include activities such as improved feeding regimes, feed additives, manure management technologies (e.g. biogas), improved breeds, grazing management, and digital monitoring tools may pose localized risks related to nutrient pollution, management and resource efficiency if poorly designed and managed. These risks are context-specific and manageable through appropriate mitigation measures including nutrient management planning, regulated use of feed additives, technical training, and adherence to relevant national regulations. The project level ESMP in this case will include pollution control measures to mitigate, minimize and manage any risks and potential adverse impacts that may be related to resource use and pollution.
Public Health	x	**No risk:** The project is not expected to have any impact on public health. Innovations supported by the project are expected to lead to increased climate resilience, productivity and food security in the face of increasing temperatures and extreme weather events.
Physical and Cultural Heritage	x	**No risk:** The project does not anticipate resulting in any impacts on physical or cultural heritage. The project, will actively promote positive impacts by recognizing and promoting intangible cultural heritage, including traditional knowledge, practices and social institutions, particularly those of Indigenous Peoples and local communities. Climate innovations supported under the programme (especially those supported by IPAF) will, where relevant, integrate traditional and culturally grounded knowledge systems into their design and delivery, ensuring that such knowledge is respected, safeguarded, and co-produced with communities contributing to both climate resilience and the preservation of cultural heritage.
Lands and Soil Conservation	x	**No risk:** The project is not expected to pose risks to land and soil conservation. On the contrary, it will generate positive impacts by supporting climate adaptation innovations that directly address land degradation, soil erosion, and declining soil fertility, while promoting sustainable land management practices adapted to local contexts. Some examples of positive land and soil outcomes across different innovation areas to be supported by the project are provided below:

		- Climate resilient crop production systems: Innovations such as conservation agriculture, drought-tolerant and stress-resilient crop varieties, diversified cropping systems, and agroecological practices improve soil structure, increase organic matter, enhance water retention, and reduce erosion, thereby strengthening soil health under climate stress. - Nature-based solutions: Innovations including agroforestry, rangeland restoration, watershed management, and soil carbon enhancement practices contribute to stabilizing soils, restoring degraded lands, and improving ecosystem functions. These approaches reduce land degradation while enhancing long-term productivity and climate resilience. - Digital land management tools: Digital innovations that improve land and soil management decisions, including soil health diagnostics, land suitability mapping, and climate-informed advisory services enable farmers and land users to apply inputs more efficiently, avoid land mismanagement, and adapt practices to local soil and climate conditions. - Integration of traditional and Indigenous land stewardship practices: By recognizing and integrating traditional and Indigenous land and soil management knowledge, such as customary fallowing systems, terracing, water harvesting, and community rangeland governance, the project will reinforce sustainable land-use practices that have historically contributed to soil conservation and climate resilience.

Table 5: Programme Risk Screening against the Adaptation Fund's Environmental and Social Principles

PART III: IMPLEMENTATION ARRANGEMENTS

A. Describe the arrangements for project / programme management at the regional and multi-regional level, including coordination arrangements within countries and among them. Describe how the potential to partner with national institutions, and when possible, national implementing entities (NIEs), has been considered, and included in the management arrangements.

Overall management and regional coordination

The ASAP+ Adaptation Innovation Centre will be implemented under IFAD's ASAP+ Trust Fund, with Adaptation Fund resources received and managed through a dedicated ledger account to ensure full traceability, transparency, and accountability of financial flows. IFAD will serve as the Multilateral Implementing Entity (MIE) for the programme and will retain full responsibility for fiduciary management, environmental and social risk management, monitoring and evaluation, and reporting to the Adaptation Fund, in accordance with the Fund's Operational Policies and Guidelines.

Day-to-day management of the Adaptation Innovation Centre will be undertaken by a dedicated team housed within IFAD's Environment, Climate, Gender and Social Inclusion (ECG) Division, which is responsible for climate resilience and adaptation across IFAD's portfolio. To support effective implementation, the programme will finance a dedicated Grant Manager, a Monitoring and Evaluation (M&E) Specialist, and a Financial and Administrative Assistant. These positions will be responsible for overseeing grant operations, coordinating implementation across components, ensuring compliance with fiduciary and safeguards requirements, and meeting all reporting obligations to the Adaptation Fund. By being anchored within the ASAP+ Trust Fund and the ECG Division, the Adaptation Innovation Centre will leverage IFAD's in-house technical expertise in climate adaptation, innovation, and inclusive rural development. The Centre will also be closely linked to ECG's knowledge management functions to support systematic learning, evidence generation, and dissemination across IFAD's regional and country operations. Knowledge generation and learning activities will be coordinated by the Centre's M&E Specialist in close collaboration with IFAD technical specialists.

Regional coordination and engagement mechanisms will be established to ensure consistent implementation across regions. Each regional division will designate a focal point to serve as the primary interface between the ASAP+ Innovation Centre and country teams and will support the dedicated innovation consultants and team to be established under the programme in ensuring regional alignment of innovation priorities, facilitate engagement with national authorities and regional partners where needed. The technical backstopping during calls for proposals, grant supervision, and learning activities will be under the responsibility of the Centre's team.

The programme will operate through a virtual regional coordination mechanism, convened by the ECG Division, bringing together DCO focal points, relevant regional technical specialists, and the Centre's team. Regular virtual coordination meetings will be organized to:

- ensure harmonized implementation approaches across regions;
- share lessons emerging from grant portfolios;
- coordinate outreach and communication for innovation calls; and
- identify opportunities for scaling through IFAD's pipeline.

Targeted regional missions and learning exchanges may be organized, resources permitting (refer to budget for details), to strengthen supervision, partnership development, and cross-country learning.

This institutional arrangement distributes responsibilities across headquarters, regional, and country levels, reducing pressure on individual country offices while maintaining country ownership and alignment with national priorities.

This placement also ensures strong linkages between innovation piloting and scaling. As the ECG Division is responsible for mainstreaming climate resilience and adaptation within IFAD's PoLG successful innovations supported under the Centre will be positioned for uptake at scale through IFAD's investment pipeline. The Centre's team will engage with ECG technical specialists and DCO regional focal points to support the integration of proven innovations into project design processes. All scaling activities will follow IFAD's standard design and approval procedures, which ensure country leadership and ownership. Consequently, uptake of innovations under Component 3 will be endorsed by national governments and aligned with national priorities, including Nationally Determined Contributions (NDCs) and National Adaptation Plans (NAPs).

Partnerships with national institutions and national implementing entities
Partnership with national institutions is a core design principle of the programme. Innovation grants will be implemented by national and sub-national entities, including public institutions, research organizations, civil society organizations, Indigenous Peoples' organizations, farmer/producer organizations, and, where appropriate, private sector entities. The programme has been explicitly designed to enable collaboration with National Implementing Entities (NIEs) accredited to the Adaptation Fund, as well as institutions operating under nationally determined mandates.

Where NIEs exist and express interest, they will be encouraged to participate as executing partners, either directly as grant recipients or as convening entities coordinating sub-national innovation initiatives. Where NIEs are not directly involved, the programme will work through nationally recognized institutions with demonstrated fiduciary, technical and safeguards capacity, ensuring alignment with national adaptation priorities and policy frameworks.

IFAD's country teams will facilitate structured engagement with national authorities, including ministries responsible for climate change, agriculture and finance, to ensure that innovation priorities reflect national needs and complement ongoing adaptation investments. This approach mirrors IFAD's established country-driven operating model under its PoLG and its supplementary funds portfolio.

Governance, oversight and screening of innovation grants
The programme will finance innovation grants under a structured and transparent grant management framework. IFAD will apply the same governance, oversight and quality assurance mechanisms used for grants financed through its Supplementary Funds, which have been assessed and accepted under IFAD's Adaptation Fund accreditation.

Grant selection will follow a competitive, multi-stage process comprising eligibility screening, technical and innovation assessment, fiduciary and institutional capacity review, and environmental and social risk screening. Clear eligibility and assessment criteria will be applied consistently across regions, with technical reviewers supporting IFAD's appraisal as appropriate, this will include regional specialists linked to each call for proposal. Final grant approval authority will rest with IFAD in accordance with its internal delegation of authority and Adaptation Fund requirements.

A central grant registry will be maintained by IFAD, capturing all approved sub-projects, their risk categorization, safeguard instruments, disbursement status, and results indicators. This registry will support portfolio-level oversight, reporting to the Adaptation Fund, and adaptive management across the programme lifecycle.

Grant implementation and fiduciary oversight
Implementation of Component 1 will follow IFAD's established grant procedures for supplementary-funded operations. The process will be initiated through competitive calls for Expressions of Interest (EOIs) issued via the AFCIA Innovation Platform. Applications will be assessed by a technical review panel against predefined eligibility, technical quality, innovation relevance, fiduciary capacity, and safeguards criteria, in line with IFAD policies and guidelines. Final grant approval decisions will be taken by the IFAD Vice President[8].

All grant applications will be fully aligned with IFAD's Social, Environmental and Climate Assessment Procedures (SECAP) and the AF's Environmental and Social Principles, as determined and endorsed by the Adaptation Fund as part of IFAD's accreditation and reaccreditation process. Prior to signature of any grant agreement, IFAD will conduct due diligence on all selected grantees to assess fiduciary, governance, and risk management capacity (Inclusive of Know your Customer, sanctions and anti-money laundering and anti-terrorism checks). Funds will be disbursed to designated accounts under legally binding grant agreements that clearly define scope of work, budgets, reporting requirements, and compliance obligations, ensuring appropriate fiduciary oversight and transparency in the use of Adaptation Fund resources.

Through Component 1, the programme aims to empower a diverse range of local-level institutions that play a critical role in driving innovation for climate adaptation in rural contexts. This approach ensures that financing reaches entities with deep contextual knowledge and strong incentives to develop, test, and scale locally appropriate solutions (institutions are listed above).

Environmental and social risk management and ESMS application
IFAD will ensure full and consistent application of its Environmental and Social Management System (ESMS) to all innovation grants. All sub-projects will be screened in accordance with IFAD's Social, Environmental and Climate Assessment Procedures (SECAP) and the Adaptation Fund's Environmental and Social Policy. No Category A activities will be financed under the programme.

IFAD will provide targeted capacity support to executing entities to strengthen their ability to identify, manage and monitor environmental and social risks. This will include guidance on screening, preparation of Environmental and Social Management Plans where required, stakeholder engagement, grievance redress mechanisms, and reporting. IFAD will retain oversight responsibility for safeguards compliance, conducting regular supervision and spot checks, and ensuring that corrective actions are implemented as needed.

This centralized yet capacity-building-oriented approach ensures consistency, risk mitigation and compliance across a diverse portfolio of innovation grants, while strengthening national institutions over time.

[8] If grant recipients are private sector entities, the approval stands with IFAD Executive Board.

Financial management, execution arrangements and cost controls

The programme will be implemented through an Adaptation Fund–approved MIE Aggregator model, with IFAD, through the ASAP Trust Fund, serving as the sole Multilateral Implementing Entity (MIE). IFAD retains full fiduciary responsibility, environmental and social risk management, monitoring, reporting, and compliance with the Adaptation Fund's policies and standards.

Innovation activities will be executed by grantees through competitively awarded grants, including national and regional universities, research institutes, public agencies, civil society organizations, Indigenous Peoples' organizations, and small and medium-sized enterprises. These entities will be responsible for day-to-day execution under IFAD's oversight. Financial flows are channeled exclusively from the Adaptation Fund to IFAD and onward to grantees through grant agreements. Reporting flows and accountability are maintained from grantees to IFAD, and from IFAD to the Adaptation Fund. Any execution functions performed by IFAD are limited to programme-level functions and costed proportionately, in line with Adaptation Fund Board Decision B.37/1 and the Operational Policies and Guidelines.

The programme budget complies with the Adaptation Fund's provisions for regional programmes, including limits on implementing entity management fees and execution costs, as stipulated in

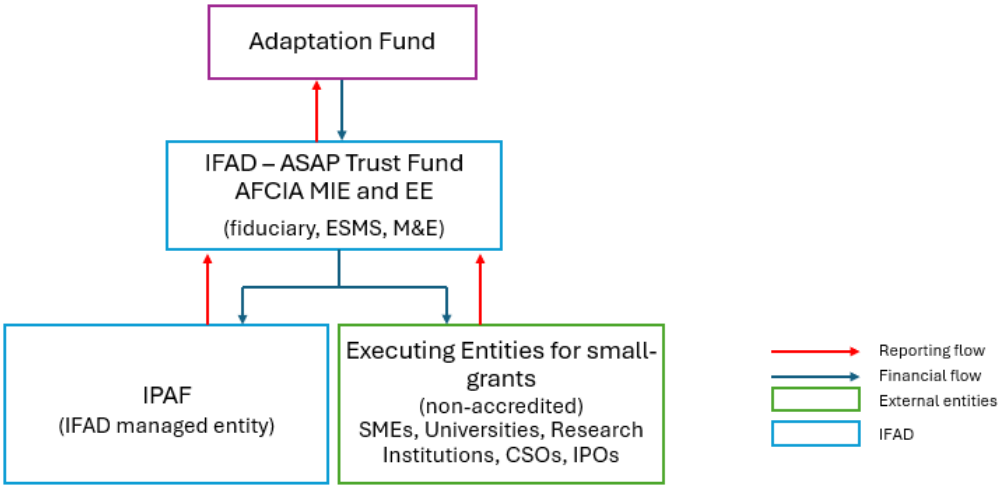


Figure 5: AFCIA Delivery Mechanism under the MIE Aggregator Model

AFB/B.25/6/Rev.2. IFAD will clearly distinguish between implementing entity management functions and execution functions in the programme budget. Where IFAD performs limited execution roles, these will be justified and kept within the applicable thresholds, with full transparency provided to the Adaptation Fund.

Financial management, procurement, disbursement and audit arrangements will follow IFAD's established procedures for supplementary-funded grants, ensuring robust fiduciary control, accountability and value for money. These arrangements have been applied extensively across IFAD's global grant portfolio and provide a tested foundation for managing a multi-country innovation programme at scale.

B. Describe the measures for financial and project / programme risk management.

Given the multi-regional nature of the ASAP+ Adaptation Innovation Centre, IFAD recognizes that risk profiles will vary significantly across geographies. Financial maturity in Middle-Income Countries differs from that in Least Developed Countries (LDCs), just as security risks in the Sahel differ from climate risks in Small Island Developing States (SIDS). As a multi-regional innovation facility, the programme faces a diverse risk landscape ranging from fiduciary challenges in small community-based organizations to systemic climate shocks in vulnerable regions. To address this, IFAD adopts a tiered risk management approach.

At the Institutional Level, IFAD (as the MIE) applies its established Corporate Integrated Risk Management Framework to ensure fiduciary standards, safeguards compliance, and global coordination. At the Portfolio Level, the programme acknowledges the higher risks inherent in testing innovations with non-traditional partners. These risks are managed through a rigorous cycle of due diligence, capacity building, and milestone-based financing, overseen by the dedicated PMU within the ECG Division and supported by IFAD Country Teams.

Risks		Ranking Likelihood/Severity	Mitigation Measures
Category	**Description**		
Financial Management & Fiduciary Compliance	The programme targets a diverse range of Executing Entities to implement innovation grants, including small NGOs, producer organizations, and private entities. These partners may lack robust financial management systems, increasing the risk of ineligible expenditures, reporting delays, or ability to absorb funds in line with IFAD/AF standards Regional Consistency: Applying consistent financial controls across different countries with varying banking regulations and currency volatility challenges financial cohesion Timeline issues: Delays in financial reporting by small entities may halt disbursements, causing liquidity crunches that stall innovation activities.	M	Financial Eligibility Assessment: IFAD will conduct a financial management assessment of the selected entities This confirms legal status, solvency, and the ability to manage separate grant accounts. Milestone-Based Disbursements: Grant funds will not be released as large upfront payments. Disbursements will be released in tranches (e.g., 30/40/30) triggered strictly by the verification of financial reports and physical progress.
Programmatic & Performance Risks	Innovation Viability: There is an inherent risk that the selected innovations (technologies, business models, or approaches) fail to deliver the expected adaptation benefits or prove technically unviable when tested in real-world conditions. Contextual Mismatch: An innovation successful in one region may fail in	M	Technical Screening: The competitive selection process will apply rigorous criteria to ensure the agro-ecological suitability of proposed innovations. Technical reviewers will assess applications to ensure that solutions are viable for the target area's climate conditions, environmental characteristics, institutional context, and socio-economic realities.

	another due to distinct agro-ecological or socio-economic factors.		Strategic Alignment: Selection criteria will strictly require demonstration of alignment with national NDCs, NAPs and NAPAs to ensure policy relevance Portfolio Approach: The programme manages risk at the portfolio level. By diversifying investments across regions, innovation types and thematic sectors. This approach spreads risk, enables experimentation across different contexts, and increases the likelihood of identifying scalable and impactful solutions., Adaptive Management: The central grant registry and M&E framework will enable continuous performance monitoring of pilots. Based on performance evidence, the PMU and ASAP team at IFAD HQ will retain the authority to adapt, restructure, or discontinue underperforming grants at an early stage in order to safeguard resources and optimise portfolio results.
Implementation & Contextual Risks	External Shocks: The multi-regional nature of the programme exposes it to varied external shocks, including political instability, conflict, or extreme weather events, which may delay implementation or render field sites inaccessible.	H/M	Fragility Integration: In fragile contexts, the programme will utilise IFAD's existing operational procedures for fragile states, allowing for flexible implementation arrangements. Remote Monitoring: Where physical access is restricted, the programme will utilise digital monitoring tools and local third-party monitors to verify progress. Contingency Planning: Grant agreements will include provisions for force majeure and adaptive management, allowing activities to

			be paused or reprogrammed in response to sudden shocks.
Coordination & Governance Risks	Lack of Alignment: Risks that regional innovation priorities do not align with national government agendas (NDCs/NAPs) or that activities duplicate existing national efforts. Endorsement Delays: Obtaining formal endorsements for piloting innovations may face administrative delays.	M	Phased Endorsement Strategy: As detailed in the management arrangements, IFAD will secure Designated Authority (DA) endorsements prior to the disbursement of country-specific grants, ensuring national ownership. Institutional Linkages: The placement of the AFCIA Innovation Centre within the ECG Division ensures that innovation activities that will be selected to be scaled up are linked to IFAD's broader country policy dialogue, fostering government buy-in. Strategic Country Engagement: IFAD Country Teams will facilitate high-level dialogue with national ministries to ensure strategic alignment, while day-to-day monitoring of the pilots is handled by the Centre's dedicated staff/consultants to avoid overburdening country offices.
Environmental and Social Risks			Please see next section (Part III section C)

Table 6: Financial and Project Risk Management Framework

C. Describe the measures for environmental and social risk management, in line with the Environmental and Social Policy of the Adaptation Fund.

The programme has been screened for its potential environmental and social impacts against the Adaptation Fund's fifteen Environmental and Social Principles and was classified as Low Risk (Category C). The AF checklist was used to screen the programme with questions from IFAD's Environmental and Social Safeguards Screening Checklist mapped to each Principle. While the project is designed to enhance climate resilience though the innovations supported, some activities may pose low environmental and social risks that are localized, manageable, and reversible with proper mitigation measures. Further details on the risk screening, IFAD's SECAP screening tool and mitigation measures are provided in Annex 3.

An Environmental and Social Management Plan (ESMP) is included in Annex 3. At the programme level, the ESMP provides mechanisms for tracking identified risks, or any new risks, ensuring they are properly monitored, evaluated, reported on, and addressed. The ESMP will be revised following selection of small grants based on the risk screening for USPs and will be regularly reviewed and revised throughout the implementation of the programme. Annex 3 also details the monitoring and reporting procedures for the ESMP throughout the project cycle and the procedures for the management of potential risks arising from the innovation grants or unidentified sub-projects during implementation of the programme.

Grievance mechanism

The project will utilize IFAD's existing grievance mechanism to allow affected to raise concerns in case the project is not complying with its social and environmental policies or commitments. A grievance mechanism will be established at the community and at the programme level. At the community level, consultations will be held with the community and beneficiaries of the innovation grants to be implemented to ensure the prevention of grievances that might arise from project activities. The grievance mechanism will consider the complexities related to rural locations, traditional decision-making structures and existing social tensions. However, if there are any grievances, the redress mechanism below is proposed:

- Community level

Some communities already have their own community-based system for grievance. These structures are within the village structure through the existing village leadership. The legitimacy of village leadership involvement is the vast amount of knowledge they have about land ownership and proximity to affected households. However, not all grievance cases are resolved within the traditional system, so other superior authorities need to be involved to follow up on open cases. It is worth noting that all possible community-based approaches are prioritized, and efforts are made to ensure that complaints are resolved at that level. The judicial system is used as a last resort. Project support to conflict resolution mechanisms will empower communities to better handle grievances and resolve conflicts before they escalate.

- Programme level

The guiding principles to follow when resolving a complaint include, but are not limited to: fairness, respect for human rights, compliance with national regulations, consistency of standards, equality, honesty of transparency, and above all respect for each other. Grievance redress mechanism should be shared with the community during the project inception workshop and subsequent meetings with the beneficiaries and follows these principles:

a) As part of the grievance mechanism, the contact details of relevant project partners will be made available to stakeholders including project beneficiaries and local communities. Contact

numbers will be displayed at common or predominant places along with the project details. This is expected to promote social auditing of project implementation. The grievance mechanism will be available to all areas where the programme will operate through innovation grants. However, the functionality of the mechanism rests with the beneficiaries considering that the project including the grievance mechanism is envisaged to be a bottom-up approach.

b) Complaints must be put forward by at least two people who are both nationals of the country concerned and/or living in the project area.
c) Complaints from foreign locations or anonymous complaints will not be taken into account.
d) Complaints must concern projects currently under design or implementation. Complaints concerning closed projects, or those that are more than 95 per cent disbursed, will not be considered.

Grievances are aimed to be addressed at the field level by the project team which will be the first level of redress mechanism. If the grievance is not resolved at the field level, it will be escalated to IFAD who will be responsible for addressing grievances related to violation of any of the provisions of Environmental and Social Policy of the Adaptation Fund. All grievances received and action taken will be included in the progress reports for reporting and monitoring purposes.

The IFAD Enhanced Complaints Procedure complements project-level grievance redress mechanisms if the PMU or other concerned stakeholders do not respond adequately, or if the complainants feel they may be subject to retaliation from these entities. IFAD guarantees confidentiality if requested by the complainants. Complaints can be submitted in the language of the complainants by letter, email (SECAPcomplaints@ifad.org) and/or the web form available https://www.ifad.org/en/accountability-and-complaints-procedures.

D. Describe the monitoring and evaluation arrangements and provide a budgeted M&E plan.

Monitoring and evaluation arrangements are aligned with the programme's innovation-focused MEL framework described under Component 2 and are detailed in the M&E plan (Table 4). These arrangements ensure systematic data collection, performance tracking, and evidence generation across the programme lifecycle.

An online inception workshop will be conducted to align IFAD teams and key stakeholders in the design of the programme, MEL framework and reporting requirements. Baseline data collection will establish reference points for key indicators, including innovation performance, adoption potential, and inclusion outcomes.

During implementation, IFAD will be responsible for overall programme monitoring and supervision. Annual project performance reports will be prepared by the programme team, drawing on data aggregated through the MEL framework. Grantees will submit quarterly performance reports through the ASAP+ AFCIA digital platform, ensuring regular and standardized data flows on implementation progress, results, and compliance with environmental, social, and gender requirements.

A mid-term review will assess progress against targets, performance of the innovation portfolio, and the effectiveness of the MEL framework, informing adaptive management and any necessary course correction. Continuous supervision, including technical backstopping, will further support implementation and learning.

These arrangements ensure that data generated at innovation and community levels is systematically consolidated and used to inform decision-making, learning, and scaling pathways across the programme.

Activity	Responsible	Budget	Timeframe
Programme Inception Workshop	IFAD	Cost-neutral (online format) Supported from staff costs (M&E officer) under component 2	Year 1
Baseline data collection and report	IFAD	Supported by consultancy costs and travel allowances under activity 2.2.1 in the budget USD 28 750	Year 1
Annual project performance reports	IFAD	Supported from staff costs (M&E officer) under component 2 Budget includes field visits Total cost of M&E Officer USD 887 895	Annually
Mid-term review mission and report	IFAD, external consultant	Supported by MIE fees Total USD 54 800	Year 3
Quarterly performance reports from grantees	Grantees	Performance reports to be prepared by grantees and report through ASAP+ AFCIA platform USD 150 253 for platform creation	Every 3 months
Bi-annual programme coordination meetings	IFAD, Grantees	Cost neutral as they will be delivered virtually	Every 6 months
Terminal Evaluation	IFAD, external consultant	Supported by MIE fees Total USD 99 290	At project closure

Table 7: Budgeted M&E Plan

E. Include a results framework for the project / programme proposal, including milestones, targets, and indicators.

The results framework for the AFCIA Programme is described in the table below. Please also refer to Annex 5 for the ASAP+ and IPAF Results Frameworks. Grantees will have to select and report a minimum of two additional indicators from either the ASAP+ or IPAF results framework

Project Outcomes	Outcome Indicator	Baseline	Target	Means of verification	Frequency	Responsibility	Assumptions
Outcome 1.1 Small-scale farmers, including women and youth, as well as Indigenous Peoples have increased access to innovative technologies and/or practices that reduce their vulnerability to climate change impacts	# of beneficiaries supported with access to scaled innovations for climate adaptation (linked ASAP+1 Indicator) (disaggregated by gender, youth, IPs)	0	160,000 farmers[9]	Stakeholder surveys, Grant progress reports	Quarterly	Grantees and IFAD	• Successful innovations are taken up into IFAD PoLG operations • National governments endorse integration of innovations into investment projects. The target assumes that a portfolio of innovation small grants reaches an initial 300-500 beneficiaries at pilot stage and that a limited number of successful innovations are subsequently mainstreamed into IFAD's Programme of Loans and Grants under IFAD14, where individual country projects typically reach several hundred thousand beneficiaries.
Outcome 2.1 Strengthened awareness and national/local ownership of innovative climate adaptation and climate risk reduction technologies and practices through dissemination of	Percentage of target users and relevant institutions reporting increased awareness, confidence, and readiness to adopt climate adaptation innovations	0	60 per cent	Stakeholder surveys; innovation target user assessments	Annually	Grantees and IFAD	Target users and relevant institutions have access to project-supported knowledge products, and learning platforms, and are willing and able to apply the information to inform their decisions and practices.

[9] This is an estimate that was calculated, based on analysis of closed and completed ASAP1 projects, for which the cost per beneficiary ranges from USD 25-67-240 (25% percentile, median, 75% percentile) and the estimated number of innovation grants that will be supported across piloting, early scale and catalytic scale (research stage grants will not reach any direct beneficiaries). 26 grants will be supported in total across these three stages and based on the respective estimate for the number of beneficiaries reached by innovations across each of these stages, the total number of beneficiaries that will be reached through the AFCIA programme is estimated at around 164,500. This figure represents an estimate, and a more accurate target will be reassessed at Mid-Term Review based on the impact potential of the selected grantees and linkage with IFAD projects for scaling.

evidence and knowledge.	(disaggregated by gender, youth, IPs)						
Outcome 3.1 Viable innovative adaptation technologies and practices are scaled and replicated into national-scale investment projects under IFAD's PoLG	# of innovations successfully integrated into IFAD PoLG	0	10	Project design reports and/or restructuring memos	Twice, mid-year and project end	IFAD	Focus of innovations and scaling timelines are aligned with IFAD programmes and there is appetite to integrate innovations.
Output	**Output Indicator**	**Baseline**	**Target**	**Means of verification**	**Frequency**	**Responsibility**	**Assumptions**
Output 1.1 A portfolio of locally led, gender-responsive innovation grants is implemented to pilot climate-adaptive technologies and practices, with at least 50 per cent directly supporting women, youth and Indigenous Peoples.	# of innovation concepts submitted through the online platform, disaggregated by region and theme.	0	300	Submission of proposals through platform	Following each call for proposals	IFAD	• Sufficient awareness of funding opportunities is achieved through outreach and partner networks across the five regions • 5 regional calls for proposals will be launched and based on experience from similar IFAD-supported initiatives each call is expected to generate approximately 60 proposals • Local innovation ecosystems, civil society organizations, SMEs, and community actors have adequate capacity and interest to submit proposals. • Women-, youth-, and Indigenous Peoples–led organizations are able to access calls and application support mechanisms.
	# of innovation pilots implemented and completed,	0	30	Grant agreements signed and completion	Annually and at programme completion	Grantees	• From the anticipated 300 submitted proposals, technical screening and evaluation will identify the top 10% of proposals that meet eligibility, technical feasibility, and alignment with climate adaptation priorities.

	Disaggregated by gender, youth, IPs			reports submitted			• National regulatory approvals and technical clearances required for pilot implementation are obtained in a timely manner. • Selected innovators retain operational capacity to implement pilots throughout the grant period. • Climatic, environmental, or security conditions do not prevent field implementation. • Grant recipients comply with Adaptation Fund Environmental and Social Policy and national standards.
Output 2.1 Structured evidence on innovation performance and user experience is generated across the grant portfolio.	% of funded innovations with documented lessons learned	0	100%	MEL database, Innovation progress reports	Annual	Grantees	• All funded innovations will be required to submit annual progress reports and final lessons learned as part of the grant agreements. • Grantees have sufficient capacity and commitment to document and share lessons learned. • MEL framework tools and guidance are accessible and clear, enabling standardized reporting. • Innovations are implemented as planned and generate sufficient observable results for documentation.
	Number of evidence-based knowledge products developed	0	5	Published products, dissemination records	Annual	Grantees, MEL specialists	• Target is informed by the portfolio size and allows for synthesis of learning across portfolio, consolidating lessons from multiple pilots around key themes. This approach ensures that knowledge products are comparable, analytically robust, and useful for policy, replication, and scaling, rather than fragmented individual reports for each grant. • Data quality and reporting from innovations generates adequate evidence and lessons
Output 2.2 Successful innovations and	# of community-level/peer-to-peer	0	30	Meeting reports	Annual	Grantees	• The target is based on the portfolio of grants and the plan to strengthen at least one platform per innovation to support cross-community learning and adoption.

practices are systematized, documented, and shared at the National and Inter-regional and local levels to increase adoption and uptake at scale through peer-to-peer learning platforms and SSTC.	learning platforms strengthened						• Communities are willing to participate and maintain engagement in learning platforms. • Local institutions and community leaders are functional and supportive, providing venues, mobilization, and legitimacy.
	#of stakeholders engaged in community-level/peer-to-peer learning platforms (disaggregated by sex, age and vulnerability status)	0	2000 Of which at least 50% are women	List of participants	Annual	Grantees	• With 30 platforms and an expected average of around 50 participants per platform, the total engagement target is 2,000 stakeholders. • Grantees are able to mobilize local stakeholders and apply inclusive facilitation approaches that enable participation of women and vulnerable groups. • Stakeholders are motivated to participate and share knowledge.
	Number of national or inter-regional knowledge exchange events conducted (including SSTC)	0	5	Event reports/agendas	Annual	IFAD	• Countries and local innovation leaders willing to engage in SSTC and share experiences • Logistical, institutional, and coordination arrangements allow events to take place as planned.
Output 3.1 Clear, evidence-based criteria for scaling are defined, and suitable IFAD projects are identified to mainstream successful innovations	Framework assessing scale readiness of innovations developed	0	1	Approved scale-readiness framework	Once, mid-term	IFAD	Sufficient evidence is generated from innovation pilots to inform scale-readiness criteria
	Repository with IFAD projects and entry points for scaling developed and kept up to date	0	1	Online repository; update logs	Annual	IFAD	Required data from IFAD country teams and project documentation is accessible and kept up to date
Output 3.2 Targeted technical assistance is	Number of scaling packages developed	0	5	Approved scaling packages; technical	Annual	IFAD	• The target of five scaling packages reflects a selective approach to scaling, recognizing that only a subset of the innovation portfolio will reach sufficient maturity, evidence generation, and operational readiness for

provided to IFAD's PoLG to ensure effective integration of proven innovations into their country-level investment projects at design.			assistance records			integration into IFAD investment operations. From the anticipated portfolio of 30 innovation pilots, a smaller group of high-performing innovations is expected to demonstrate clear adaptation benefits, cost-effectiveness, and institutional feasibility. • Sufficient number of innovations reach scale-readiness and have clear integration pathways • AFCIA PDT and IFAD country teams engage early in identifying innovations with scaling potential.
	Number of successful innovations scaled up through IFAD PoLG	0	10	IFAD project design/supervision reports	Annual	IFAD Country teams, AFCIA PDT	• While five formal scaling packages will be developed, individual innovations may be integrated into more than one country programme or investment project, enabling broader replication. The target therefore captures both direct scaling of AFCIA-supported innovations and adaptation or replication of proven approaches across countries and projects. • Focus of innovations and scaling timelines are aligned with country programs • Country teams and government counterparts demonstrate demand and ownership for integrating innovations in IFAD investment projects.

Table 8: Programme Results Framework

F. Demonstrate how the project / programme aligns with the Results Framework of the Adaptation Fund

Project Objective(s)[10]	Project Objective Indicator(s)	Fund Outcome	Fund Outcome Indicator	Grant Amount (USD)
Strengthen the climate resilience and food security of small-scale farmers by enabling risk-taking and supporting the development, adoption and scaling of locally-appropriate, innovative adaptation solutions that reduce climate risks and sustain agricultural productivity and livelihoods.	Innovative solutions and practices being supported by the project with the specific goal of strengthening the climate resilience and food security of small-scale farmers AND ASAP+1 Number of poor smallholder household members whose climate resilience has been increased	Outcome 8 Support the development and diffusion of innovative adaptation practices, tools and technologies	8.Innovative adaptation practices are rolled out, scaled up, encouraged and/or accelerated at regional, national and/or subnational level.	$10,000,000
Project Outcome(s)	**Project Outcome Indicator(s)**	**Fund Output**	**Fund Output Indicator**	**Grant Amount (USD)**
1 Small-scale farmers, including women and youth, as well as Indigenous Peoples have increased access to innovative technologies and practices that reduce their vulnerability to climate change impacts	Number of beneficiaries with access to scaled innovations	Output 8: Viable innovations are rolled out, scaled up, encouraged and/or accelerated.	8.1. No. of innovative adaptation practices are rolled out, scaled up, encouraged and/or accelerated at regional, national and/or subnational level.	$6,490,929
2 Strengthened awareness and national/local ownership of innovative climate adaptation and climate risk reduction technologies and practices	Percentage of target users and relevant institutions reporting increased awareness, confidence, and readiness to adopt climate adaptation innovations	Output 8: Viable innovations are rolled out, scaled up, encouraged and/or accelerated.	8.2. No.of key findings on effective, efficient adaptation practices, products and technologies generated	$1, 517,664

[10] The AF utilized OECD/DAC terminology for its results framework. Project proponents may use different terminology but the overall principle should still apply

through dissemination of evidence and knowledge.		Output 3.1: Targeted population groups participating in adaptation and risk reduction awareness activities	3.1.1 People participating in activities to improve awareness of climate risks and how to address them	
3 Viable innovative adaptation technologies and practices are scaled and replicated into national-scale investment projects under IFAD's PoLG	Number of innovations successfully integrated into IFAD PoLG	Output 8: Viable innovations are rolled out, scaled up, encouraged and/or accelerated.	8.1. No. of innovative adaptation practices, tools and technologies accelerated, scaled-up and/or replicated	$945,953

Table 9: Programme Objectives, Expected Outcomes, and Grant Allocation

The programme will report on relevant Adaptation Fund (AF) Core Impact Indicators in accordance with the Methodologies for Reporting Adaptation Fund Core Impact Indicators and the AF Strategic Results Framework. Final indicator selection will be confirmed during the inception phase based on the finalized scope of programme activities following the calls for innovation proposals.

At a minimum, the programme will collect and report data on the number of direct and indirect beneficiaries disaggregated by gender and relevant vulnerability criteria. Additional applicable core indicators related to resilience outcomes, ecosystem and livelihood benefits, innovation uptake, and institutional capacity may be included as relevant.

Reporting will be integrated within the programme's Monitoring, Evaluation and Learning (MEL) framework, which will aggregate data from supported innovations and implementation partners using standardized reporting tools. The MEL arrangements described in sections above will support disaggregated data collection, ESP monitoring, and quality assurance for AF reporting. Core indicator results will be consolidated through regular performance reporting to the Adaptation Fund.

G. Include a detailed budget with budget notes, broken down by country as applicable, a budget on the Implementing Entity management fee use, and an explanation and a breakdown of the execution costs.

Outcomes	Outputs	Activities	Cost Category AF	Y1	Y2	Y3	Y4	Y5	Y6	Total
Outcome 1 Small-scale farmers, including women and youth, as well as Indigenous Peoples, have increased access to innovative technologies and practices that increase their resilience to climate change impacts.	Output 1.1 A portfolio of locally led, gender-responsive innovation grants is implemented to pilot climate-adaptive technologies and practices that reduce climate vulnerability	1.1.1 Source and select locally led adaptation innovations	Consultants	$ 25 200	$ 25 200	$ 25 200	$ 25 200	$ 25 200	$ 25 200	$ 151 200.00
			Contractual Services	$ 150 253		$ -	$ -	$ -	$ -	$ 150 253.00
			Operating Costs	$ 66 000.00	$ 67 650.00	$ 69 341.00	$ 71 074.00	$ 72 852.00	$ 74 673.00	$ 421 590.00
			Other Direct Costs	$ 112 385.00	$ 115 195.00	$ 118 074.00	$ 121 026.00	$ 124 052.00	$ 127 154.00	$ 717 886.00
		1.1.2 Strengthen innovation readiness through TA and de-risking	Consultants	$ 80 000	$ 120 000					$ 200 000.00
		1.1.3 Grant awards and implementation	Grants	$ -	$ 225 000	$ 225 000	$ -	$ -	$ -	$ 450 000.00
			Grants		$ 450 000	$ 450 000	$ -	$ -	$ -	$ 900 000.00
			Grants		$ 500 000	$ 500 000	$ -	$ -	$ -	$ 1 000 000.00
			Grants		$ 1 250 000	$ 1 250 000	$ -	$ -	$ -	$ 2 500 000.00
Component 1 Sub Total										**$ 6 490 929.00**
Outcome 2 Strengthened awareness and national/local ownership of innovative climate adaptation and climate risk reduction technologies and practices through dissemination of evidence and knowledge.	Output 2.1 Structured evidence on innovation performance and user experience is generated across the grant portfolio.	2.1.1 Establish and operationalise an innovation focused MEL framework for knowledge systematization	Consultants	$ -	$ 6 000	$ 4 000	$ -	$ -	$ -	$ 10 000.00
			Operating Costs	$ 139 000.00	$ 142 475.00	$ 146 037.00	$ 149 688.00	$ 153 430.00	$ 157 266.00	$ 887 896.00
			Other Direct Costs	$ 16 982.00	$ 17 407.00	$ 17 842.00	$ 18 288.00	$ 18 745.00	$ 19 214.00	$ 108 478.00
			Travel	$ -	$ 11 250	$ 7 500	$ -	$ -	$ -	$ 18 750.00
		2.1.2 Generate evidence on Innovation performance and User experience	Consultants	$ -	$ 56 520	$ 56 520	$ -	$ -	$ -	$ 113 040.00
		2.1.3 Develop knowledge products from evidence	Consultants	$ -	$ -	$ -	$ 36 000	$ 36 000	$ 18 000	$ 90 000.00
			Contractual Services	$ -	$ -	$ -	$ 14 000	$ 14 000	$ 7 000	$ 35 000.00
	Output 2.2 Successful innovations and practices are systematized, documented, and	2.2.1 Community-level, peer-to-peer platforms are leveraged and strengthened	Training	$ -	$ 90 000	$ -	$ -	$ 90 000	$ -	$ 180 000.00
		2.2.2 Facilitate South–South cooperation and policy	Training	$ -	$ -	$ 6 500	$ 13 000	$ 13 000	$ -	$ 32 500.00
			Travel	$ -	$ -	$ 8 400	$ 16 800	$ 16 800	$ -	$ 42 000.00
Component 2 Sub Total										**$ 1 517 664.00**
Outcome 3 Viable innovative adaptation technologies and practices are scaled and replicated into national-scale investment projects under IFAD's PoLG	Output 3.1 Clear, evidence-based criteria for scaling are defined, and suitable IFAD	3.1.1 Develop scale readiness criteria for innovations	Consultants	$ 12 000	$ 12 000	$ 12 000	$ 12 000	$ 12 000	$ 12 000	$ 72 000.00
		3.1.2 Map innovations to IFAD projects and entry points	Consultants	$ 72 000	$ 72 000	$ 72 000	$ 72 000	$ 72 000	$ 72 000	$ 432 000.00
	Output 3.2 Targeted technical assistance is provided to IFAD's PoLG to ensure effective	3.2.1 Develop scaling packages for prioritized innovations	Consultants	$ -	$ -	$ -	$ -	$ 12 000	$ 12 000	$ 24 000.00
		3.2.2 Provide targeted TA to IFAD country teams and	Consultants	$ -	$ -	$ -	$ -	$ 155 000	$ 155 000	$ 310 000.00
			Other Direct Costs	$ 16 900	$ 17 323	$ 17 756	$ 18 199	$ 18 654	$ 19 121	$ 107 953.00
Component 3 Sub Total										**$ 945 953.00**
Project Component TOTAL				$ 690 720	$ 3 178 020	$ 2 986 170	$ 567 275	$ 833 733	$ 698 628	**$ 8 954 546.00**
Project Execution Costs (1.5%)				$ 22 727	$ 22 727	$ 22 727	$ 22 727	$ 22 728	$ 22 728	**$ 136 364.00**
MIE fees (10 %)				$ 151 000	$ 151 000	$ 205 800	$ 151 000	$ 151 000	$ 99 290	**$ 909 090.00**
TOTAL FINANCING REQUEST				**$ 864 447**	**$ 3 351 747**	**$ 3 214 697**	**$ 741 002**	**$ 1 007 461**	**$ 820 646**	**$ 10 000 000.00**

Table 10: Detailed Budget

Cost category(Project Management Fees)	Total (USD)
Mid-term report	30 000
Mid-term review mission	24 800
Terminal evaluation	99 290
Evaluation and KM advice	145 000
Legal Support	110 000
Audit and inspection	105 000
Finance and budget support	160 000
Program performance and supervision	235 000
Total	**909 090**

H. Include a disbursement schedule with time-bound milestones.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total
Project Funds	690 720	3 178 020	2 986 170	567 275	833 733	698 628	8 954 546
PEC	22 727	22 727	22 727	22 727	22 727	22 727	136 364
Implementing Entity Fees	151 000	151 000	205 800	151 000	151 000	99 290	909 090
Total	864 447	3 351 747	3 214 697	741 002	1 007 461	820 646	10 000 000

Table 11: Disbursement Schedule

Annex 1 AFCIA Background Study

Contents

Introduction

1. Climate change poses an increasingly severe threat to small-scale agriculture and rural livelihoods across the Internation Fund of Agricultural Development's (IFAD) regions of operation, exacerbating existing vulnerabilities related to poverty, food insecurity, environmental degradation and limited access to services and markets. Small-scale farmers, including women, youth and Indigenous Peoples, are already experiencing the impacts of rising temperatures, shifting rainfall patterns and more frequent and intense climate shocks, which undermine productivity, incomes and resilience. In this context, innovation, defined as the process of translating ideas into valuable solutions for vulnerable communities through incremental, breakthrough, or adaptive approaches, plays a critical role in enabling climate adaptation by supporting risk-taking, improving access to climate-responsive solutions and accelerating the diffusion of practices that can be sustained and scaled. However, despite a growing global focus on innovation for climate adaptation, significant gaps remain in understanding which innovations are most relevant for smallholder contexts, where they are emerging, what constrains their uptake and how they can be effectively scaled through development finance.

2. The aim of this background study is to inform the design of the Adaptation Climate Innovation Accelerator (AFCIA) Programme by providing a structured analysis of the regional innovation landscape for climate adaptation in smallholder agriculture. The study aims to identify key climate trends and adaptation challenges, assess the current state of innovation and financing, highlight major gaps and barriers, and articulate priority innovation areas across IFAD's regions of operation. It adopts a desk-based analytical approach, drawing on peer-reviewed literature, global assessments, donor and development partner reports, and IFAD's strategic and operational documents. This analysis is further strengthened by a preliminary diagnostic conducted on a targeted sample of Country Strategic Opportunities Programme (COSOP)[11] reports, which mapped strategic objectives against climate adaptation priorities and identified critical systemic voids such as scalability barriers, data literacy deficits, and financial constraints. These findings will be validated and complemented through stakeholder consultations with IFAD country and regional teams, external partners, and innovation actors to ensure full alignment with national priorities. Together, this evidence base provides the foundation for the design of targeted, demand-driven small innovation grants and accompanying learning and scaling mechanisms under the AFCIA programme.

Global overview

Climate trends and impacts

3. Climate change threatens the productivity of agrifood systems and their capacity to meet the needs of the people that depend upon them for their livelihoods, income, food security and well-being. Nearly half the world's population lives in households linked to agrifood systems (Davis et al., 2023) and climate change has already exposed millions of people to acute and severe food insecurity worldwide, with vulnerable groups, including women, small-scale agricultural and low-income households, hit the hardest (FAO, 2024; IPCC, 2023).

4. The impacts of climate change will continue to ravage agrifood systems in the form of

[11] A country strategic opportunities programme (COSOP) is a framework for making strategic choices about IFAD operations in a country, identifying opportunities for IFAD financing and facilitating management for results. The central objective of a COSOP is to ensure that IFAD country operations produce a positive impact on poverty. The document reviews the specific rural poverty situation in order to determine geographic sites and thematic areas for IFAD operations.

reduced crop yields, higher incidence of pests and diseases, livestock mortality, biodiversity loss, land degradation, and market and supply chain disruptions, among others (IPCC, 2023). As the planet continues to warm, climate risks to agrifood systems are projected to escalate estimates show that under a high emissions scenario global yields are expected to fall significantly for most staple crops by 2050 (Hultgren et al., 2025).

5. Ten percent of current areas for agriculture will become climatically unsuitable by mid-century, reaching up to 30 per cent by 2100 (IPCC, 2023), while climate change-driven biodiversity loss and land degradation pose serious threats to agricultural productivity, nutrition and food security (HLPE, 2025). Climate change impacts can further interact with and compound other drivers of risk, such as the direct links already established between weather extremes and severe food insecurity spikes in fragile and conflict affected settings (FSIN and GNAFC, 2025).

6. The narrative is one of urgent interdependence. Food systems are a major contributor to emissions yet are the first to fracture under global warming. Without a radical transformation in how we produce and value food, the cost of inaction will be measured in the displacement of hundreds of millions and a widespread resurgence of food insecurity. Adaptation in agrifood systems is necessary for achieving a world free of hunger and achieving food security (SDG 2), yet current adaptation efforts are insufficient to keep pace with rising climate risks (IPCC, 2023).

7. Climate-resilient agrifood systems are essential for safeguarding food security and nutrition, as they provide the sustenance necessary to feed a growing global population. They also sustain rural livelihoods by employing billions of people in farming, processing, and distribution, which in turn contributes significantly to national economies (Davis et al., 2023). To prevent climate risks from derailing progress to date on sustainable development and food security, it is crucial to strengthen the resilience and adaptive capacity of agrifood systems.

Overview of adaptation finance flows and gaps

8. Accelerating climate impacts are outpacing financial flows, creating a funding deficit that severely threatens global food security. While global climate finance reached a record USD 1.27 trillion in 2021/22, with 91 per cent of capital targeting mitigation, leaving adaptation with only a small fraction of the available capital (CPI, 2023a). The disparity between current support and actual requirements is widening. International public adaptation finance was tracked at USD 26 billion in 2023, yet developing countries require a central range of USD 310–365 billion annually by 2035. This indicates that adaptation needs are currently 12 to 14 times greater than international public flows (UNEP, 2025).

9. The burden falls disproportionately on those with the least fiscal space. Adaptation needs average 3.5–3.6 per cent of GDP for Least Developed Countries (LDCs) and Small Island Developing States (SIDS). SIDS are particularly exposed, having spent nearly 18 times more on debt repayments between 2016 and 2020 than they received in climate finance. This forces climate-exposed nations to absorb systemic risks, creating a cycle of indebtedness that restricts investment in essential resilience (UNEP, 2025).

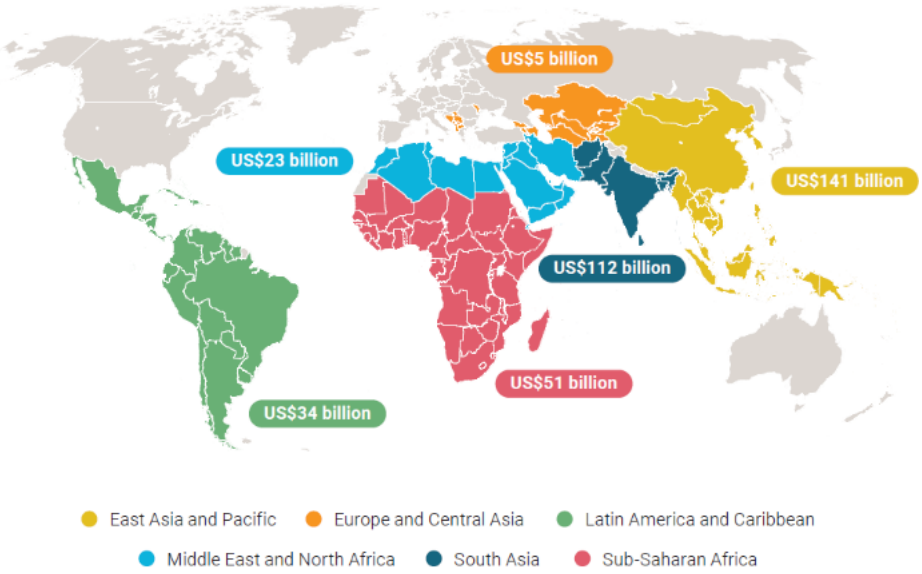


Figure 1 - Adaptation finance needs in developing countries by region (US$ billion, 2024 prices). (Source: UNEP, 2025)

10. Within this constrained landscape, agrifood systems remain notoriously underfunded. Despite their high mitigation potential and the extreme vulnerability of rural populations, the broader Agriculture, Forestry and Other Land Use (AFOLU) sector received just USD 7 billion in 2021/2022, a mere 11 per cent of all tracked adaptation finance.

11. The situation is most critical for the small-scale producers who provide up to 35 per cent of the global food supply. Small-scale agrifood systems received just USD 5.53 billion in 2019/20, representing a negligible 0.8 per cent of total tracked climate finance across all sectors (CPI, 2023b). This lack of investments creates a staggering deficit: the unmet financing gap for smallholders is currently estimated at USD 230 billion per year. Furthermore, climate change is projected to drive an additional USD 100–130 billion in annual demand for adaptation-specific needs, such as irrigation infrastructure and resilient seed systems (ISF, 2025). Given the widening financing gap, IFAD plays an indispensable and unique role as a specialized UN agency dedicated to channelling climate finance and technical support specifically to smallholder populations.

Innovations: what, where and why?

12. Closing the smallholder adaptation gap is as much a financing challenge as an innovation one. While global climate finance has grown, a critical "innovation deficit" persists for small-scale agriculture. The lack of dedicated investment in the "missing middle", the stage between early research and commercial scale, has created a "Valley of Death" for adaptation technologies (ISF, 2025). High-potential solutions often fail to reach smallholders not because they lack utility, but because they lack the robust, sovereign-ready evidence required to unlock large-scale public financing.

13. Addressing the smallholder gap requires more than just capital; it requires a fundamental rethinking of the mechanisms used to convert finance into durable, locally relevant resilience. In this context, innovation must be understood not as a purely technical fix or 'radical novelty,' but as a systemic, endogenous process involving shifts in social practices, institutional arrangements, and economic models. A technological asset (such as a drought-tolerant seed) is ineffective without accompanying social innovation (community seed banks), institutional innovation (secure land tenure), and ecological innovation

(regenerative soil management).

14. Current development discourse is often saturated with an "innovation imperative" that prioritises high-tech, capital-intensive solutions over systemic social change. It is vital to reclaim the definition of innovation to prevent maladaptation, interventions that reinforce exclusion, depoliticise climate action, or ignore the root causes of vulnerability.

15. Innovation is not a "silver bullet" but a lever for broader agrifood system transformation. Technology is situated alongside, rather than above, social structures. Therefore, effective interventions are characterized by their accessibility to a diversity of farmers. They feature the genuine inclusion of voices most vulnerable to climate change, specifically rural women, youth, and Indigenous Peoples. By targeting these groups, innovative initiatives unlock local and Indigenous knowledge, often the most time-tested form of adaptation, that is frequently overlooked by top-down approaches.

16. Finally, the ASAP+ Innovation Centre adheres to the principles of Responsible Innovation (Owen & Stilgoe, 2013). This refers to the process of designing and implementing innovations in a way that anticipates and evaluates potential impacts on society and the environment. It requires inclusive, transparent decision-making involving a broad range of stakeholders. The goal is to ensure that innovation aligns with societal needs and ethical standards, specifically regarding data privacy in digital tools and land rights in nature-based solutions, promoting sustainability and positive social outcomes while rigorously "Doing No Harm."

The landscape: Agri-food innovations for climate resilience

17. The current landscape of climate adaptation is characterized by a fundamental shift from isolated technical fixes to a holistic, systemic approaches. Consequently, the frontier of innovation now operates through bundles, integrated packages of solutions designed to address the multifaceted constraints faced by farmers.

18. The agrifood innovation landscape can be defined not as a list of technologies, but as four interconnected Macro-Domains that must function together (IFAD, 2020):
    a. Agricultural Production and Value Chain (APVC): This domain is dominated by technical advancements such as abiotic stress-tolerant varieties (drought, heat, salinity) and underutilised crops. It increasingly relies on digital integration, such as AI-enabled advisory services and precision agriculture tools.
    b. The Natural Pillar (NP): Co-occurring with production technologies are Nature-based Solutions (NbS) that function as biological infrastructure. This includes watershed restoration, soil conservation (no-tillage), and silvo-pastoral systems that buffer climate risks.
    c. The Socio-Economic Pillar (SEP): Technologies fail without adoption incentives. This pillar includes innovations in human capital (Gender Action Learning Systems, GALS) and financial identity (digital credit scoring, index insurance). These tools construct "economic identities" for smallholders, allowing them to access the credit needed to buy the "Hardware."
    d. Governance Pillar (GP): This encompasses land rights regulation, participatory planning, and Agricultural Innovation Policy Labs. For instance, the deployment of renewable energy (solar irrigation) must be coupled with water governance frameworks to mitigate aquifer depletion.

19. The operational logic of this landscape is bundling, combining a new seed variety (APVC) with weather data (NP), credit access (SEP), and land rights (GP) to ensure the innovation sticks.

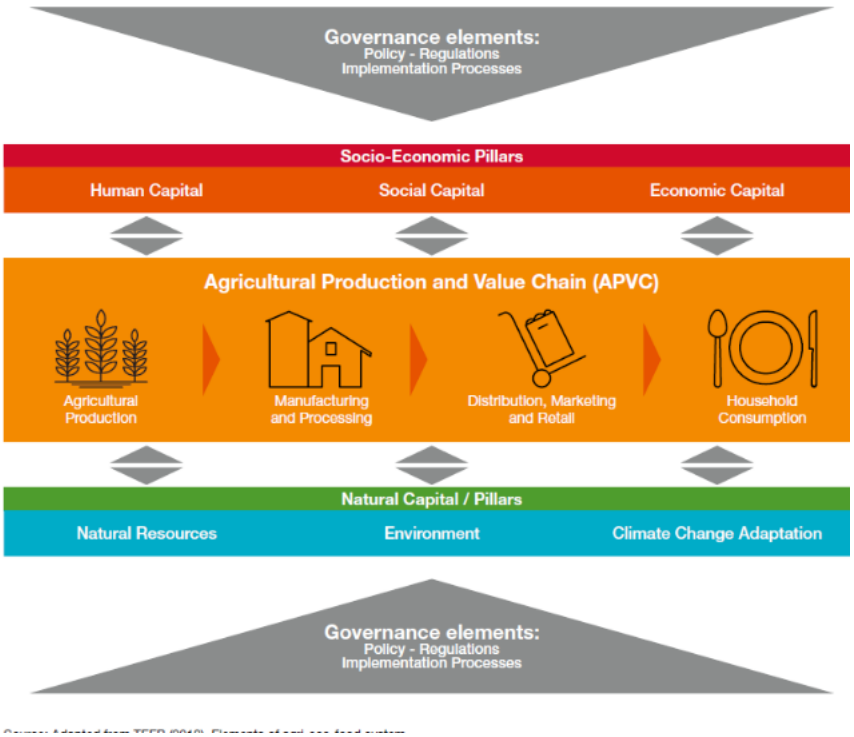


Figure 2 - Scheme of agrifood system components for which innovations can be of great importance (Source: IFAD CLE 2020)

Turning ideas into outcomes

20. It is increasingly recognized that agricultural innovation does not happen in isolation. Rather it is the outcome of collaborative networks where information is exchanged and learning processes happen (Knickel et al. 2009). Moving beyond simple technology transfer, ASAP+ adopts the "innovation systems" view, stipulating that impact results from the integration of knowledge from various actors, researchers, farmers, and financiers. However, bridging the gap between theoretical breakthroughs and on-the-ground impact requires navigating a complex landscape of constraints. Smallholder farmers operate in environments defined by severe economic barriers, where high upfront costs for hardware clash with limited access to credit. Consequently, the transition from a "pre-emergent" idea to a "mature" outcome is not a linear path, but a systemic challenge of integration.

21. ASAP+ positions itself as the bridge across the investment gap often referred to as the "Valley of Death"1 for small-scale agriculture, a sector that currently receives only 0.8 per cent of tracked climate finance. As the largest global trust fund dedicated to smallholder adaptation, ASAP+ has evolved from a simple funding mechanism into a systemic enabler. It functions not merely as a donor, but as a "Scaling Engine" that leverages IFAD's Programme of Loans and Grants (PoLG).

22. Scaling innovation requires massive capital, usually in the form of sovereign loans. However, developing governments are often reluctant to borrow for "risky" or unproven climate adaptation projects. By blending targeted grants with concessional loans, ASAP+ covers the incremental costs and initial risks of new technologies. This de-risking makes

loan packages attractive to Finance Ministries, fostering the inclusion of adaptation innovations into large-scale national investments. This mechanism allows IFAD to leverage grant resources to mobilize significantly larger sums of development finance, demonstrated by ASAP's leverage ratio of 1:7.9.

23. For innovation to endure beyond donor exit, it must be institutionalized. "Enabling" involves embedding technical solutions into national regulatory frameworks, to ensure transfer is country driven. Agricultural Innovation Policy Labs facilitate this by aligning ministries (agriculture, water, finance) around shared climate objectives. In Viet Nam, salinity monitoring tools were not just distributed but integrated into local socio-economic development plans, ensuring long-term public budget support. By leveraging South-South and Triangular Cooperation (SSTC), ASAP+ further ensures that such institutional successes are not isolated, systematically transferring proven models, such as salinity management, from one region to another.

24. Finally, the "social architecture" of scaling is secured through rigorous fiduciary and social guardrails. Unlike ad-hoc interventions, all ASAP+ grants operate within IFAD's accredited procedures and strictly adhere to Social, Environmental and Climate Assessment Procedures (SECAP). This ensures a "Do No Harm" approach while actively targeting the most vulnerable. Methodologies like the Gender Action Learning System (GALS) demonstrate this, where rigorous M&E showed that increased productivity translated directly into decision-making power for women. By distilling these lessons into global knowledge products, ASAP+ builds a robust evidence base, transforming volatile markets into sustainable ecosystems where innovation can endure.
25. To further deepen the localization of climate action, ASAP+ collaborates closely with the Indigenous Peoples Assistance Facility (IPAF). Recognizing that Indigenous Peoples act as vital custodians of biodiversity and are leaders in the fight against climate change, IPAF provides a direct channel for financing community-led innovations. This partnership ensures that ASAP+ does not merely import external solutions but actively scales "Ancestral Innovation", traditional knowledge systems that have been adapted over millennia to manage complex ecological risks.

Regional overviews

Asia and the Pacific Region (APR)

Climate context & implications for innovation

26. The Asia and Pacific region (APR) is one of the most climate-vulnerable regions in the world, owing to its diverse climate zones, high population density, extensive coastlines, and heavy reliance on natural resource-dependent sectors such as agriculture, fisheries and forestry. Climate change is already altering temperature and precipitation patterns, increasing the frequency and intensity of extreme weather events, including heatwaves, droughts, cyclones, floods and typhoons which directly threaten agricultural productivity, water security, food systems and rural livelihoods across sub-regions (Shaw et al., 2022). According to the IPCC AR6 Working Group II report, rising temperatures, changing rainfall regimes and extreme events are projected to drive declines in crop and livestock production in much of Asia, with variable impacts across sub-regions but consistently negative implications for food security and rural economies without effective adaptation action (ibid). For example, projected yield losses of major staples such as rice and maize under warmer conditions are substantial in many South and Southeast Asian contexts (ibid).

27. The Asian Development Bank (ADB) estimates that climate change could reduce the region's gross domestic product by up to 17 per cent by 2070 under high-emissions scenarios, highlighting the broad economic risk posed by climate impacts, particularly to climate-sensitive sectors including agriculture (ADB, 2024b). These risks are compounded by significant funding gaps for adaptation; current investment levels remain far below the needs identified for infrastructure, water management and agricultural resilience (ibid). Climate change also interacts with existing development deficits, such as poverty, food insecurity and weak rural infrastructure exacerbating vulnerability among smallholder farmers who often lack adequate access to risk management tools, technology and finance.
28. For smallholder agriculture in particular, these climate pressures translate into chronic yield variability, increased pest and disease pressure, water scarcity, soil degradation and livelihood instability, necessitating transformational adaptation responses rather than incremental adjustments (Shaw et al., 2022). In this context, innovation becomes central to adaptation: developing, piloting and scaling climate-responsive technologies and practices, ranging from stress-tolerant crop varieties, precision water management and early warning systems to novel digital services and climate finance instruments will be essential to enhance resilience in a region where millions of smallholders face escalating climate threats.

Current innovation landscape & major gaps

29. APR is characterised by rapid economic growth alongside persistent food insecurity and vulnerability to climate change. Approximately 100 million smallholder farmers produce over 80 per cent of the food consumed in the region, yet many operate in fragile agroecological contexts and face increasing climate risks that threaten livelihoods and agrifood system sustainability (FAO, 2020). Innovation is therefore central to enhancing resilience and maintaining agriculture as a viable economic activity for smallholders. The region benefits from a relatively dynamic innovation ecosystem, supported by a young population, expanding digital infrastructure and growing youth entrepreneurship, particularly in South and Southeast Asia. However, innovation uptake remains uneven, with significant gaps across subregions, farming systems and social groups.

30. Climate-resilient production systems and soil–water management: Innovations addressing declining soil fertility, salinity, water scarcity and land degradation are increasingly evident across APR. In South Asia, drip irrigation combined with controlled crop production in greenhouses in Bangladesh, as well as hydroponic farming in Bhutan's mountainous landscapes, are being implemented to address poor soil quality, salt intrusion and land constraints (FAO, 2020). Conservation agriculture practices are expanding in countries such as Indonesia to improve soil health and productivity. Across the Pacific, many principles aligned with regenerative agriculture, agroecology and climate-smart agriculture are embedded in traditional farming systems. However, these practices are often applied out of necessity rather than as deliberate climate adaptation strategies, and farmers frequently lack awareness of their resilience benefits, limiting systematic uptake and optimisation (FAO, 2024b). This highlights a persistent gap in climate literacy, extension services and context-specific evidence on adaptation outcomes.

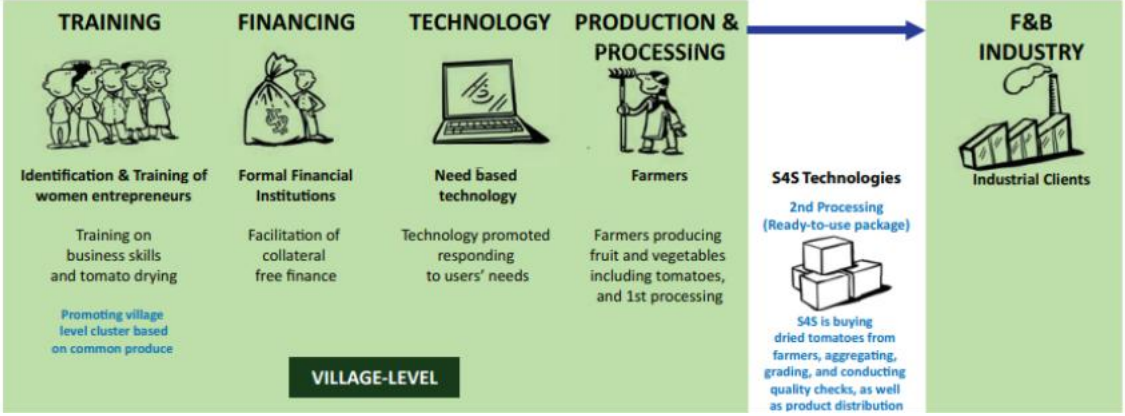
31. Crop diversification and integrated farming systems: Crop diversification and improved varieties represent a mature but still evolving innovation area in APR. In India, the introduction of climate-resilient varieties of pigeon pea, soybean, wheat and sorghum has improved yields in areas affected by both drought and excess rainfall (Aryal et al., 2019). In Viet Nam's Mekong Delta, integrated rice–prawn systems using salt-tolerant rice varieties enable farmers to cope with saline intrusion and recurrent flooding

while maintaining stable incomes (IFAD, 2022a). In the Pacific, low-cost rainwater harvesting systems, such as those implemented in Kiribati, support adaptation in rainfed systems highly exposed to rainfall variability (FAO, 2024b). Despite these advances, scaling remains constrained by limited access to finance, weak market integration and insufficient tailoring of innovations to women farmers and marginalised groups, particularly in remote island contexts.

32. Climate information services, disaster risk reduction and insurance: Climate and agroclimatic information services are among the most widespread innovations in APR, with climate and geospatial data increasingly transmitted through local languages and community channels, such as in Lao PDR. Precision agriculture tools, including drone-based data collection in Myanmar, are supporting disaster risk reduction and government response planning (FAO, 2020). Agricultural insurance schemes have expanded in parts of South Asia through national programmes in countries such as Nepal and Bangladesh, though challenges remain in loss assessment accuracy and farmer trust; in contrast, insurance markets remain nascent in countries such as Pakistan (Aryal et al., 2019). In the Pacific, early warning systems are critical due to high exposure to climate extremes, yet many farmers continue to rely primarily on traditional forecasting methods, underscoring gaps in the accessibility, usability and integration of modern climate services with Indigenous knowledge systems (FAO, 2024b).

33. Digitalisation, value-chain innovation and market access: Digital innovations are increasingly transforming extension services, traceability, and market access across the Asia and the Pacific Region (APR). ICT-enabled value-chain traceability is being piloted in Papua New Guinea through the use of distributed ledger technologies in the pig value chain, improving quality assurance and coordination among stakeholders (FAO, 2020). In Mongolia, GPS tracking technologies are being tested to monitor herd movements within nomadic production systems, supporting improved rangeland management and climate resilience. Similarly, in Cambodia, ICT-based extension and marketing platforms, such as the Chamka app under IFAD's ASPIRE programme, enabled farmers to access advisory services and markets during COVID-19 disruptions, thereby reducing post-harvest losses (IFAD, 2022a). Despite these advances, significant digital divides persist, particularly affecting women, older farmers, and remote communities, which limits equitable access to and uptake of digital solutions.

34. A related set of innovations focuses on addressing post-harvest losses (PHLs), a major challenge across APR, where up to 40 per cent of food, particularly pulses, is lost in Central and South Asia (Bennett et al., 2022). In India, the second-largest producer of tomatoes, onions, and potatoes, the highly perishable and seasonal nature of vegetables poses persistent marketing challenges. Tomato PHLs alone account for approximately 12 per cent of total production (Rojas et al., 2024). To reduce food losses in the tomato value



chain, a solar dryer combined with a sustainable, women-centred business model has been promoted in India. As a result of the introduced technology and business model (illustrated in Figure 3), tomato shelf life has been extended, food losses reduced, and secure market linkages established with the private sector partner S4S, thereby creating more resilient and inclusive market opportunities for women farmers (ibid).

Figure 3: Sustainable business model introduced to reduce PHLs in the tomato value chain in India (source: Rojas et al., 2024)

35. Nature-based solutions, ecosystem restoration and peatlands: Nature-based solutions (NbS) are gaining prominence across Southeast Asia and the Pacific as cost-effective approaches to climate adaptation, biodiversity conservation and disaster risk reduction. In Southeast Asia, NbS are increasingly recognised as pathways to enhance ecosystem services amid rapid urbanisation and climate stress, though scaling requires stronger institutional capacity, financial literacy and policy integration (ADB, 2024b). In the Pacific, NbS are widely applied in coastal, marine and forestry systems, yet their effectiveness is constrained by limited integration of scientific and Indigenous knowledge and insufficient mainstreaming into national policies (SPC, 2025). Indonesia, which hosts approximately 45 per cent of the world's peatlands, has emerged as a hub for peatland restoration innovation, including integrated water management (Fawzi et al., 2024), IoT-based peat moisture and fire risk monitoring (Muhammad et al., 2025), and agroforestry business models to attract private investment (Applegate et al., 2022). Despite technical progress, gaps remain in long-term financing, institutional coordination and community-led governance.

Priority innovation areas

36. Across the Asia and Pacific region, ongoing innovations broadly align with regional priorities, yet several areas remain underdeveloped relative to the adaptation challenges smallholder farmers face. Sectoral strategies and frameworks like the Association of Southeast Asian Nations (ASEAN) Climate Resilience Network Framework (2026-2030), ASEAN Food, Agriculture and Forestry Sectoral Plan (2026-2030), the 2050 Strategy for the Blue Pacific Continent and the Atlas of Climate Adaptation in South Asian Agriculture consistently highlight the importance of climate-smart agriculture, nature-based solutions, integrated water management and disaster risk reduction, while digital innovations and knowledge systems to support smallholders are a crosscutting priority across all areas.

South and Southeast Asia

37. In South and Southeast Asia, a priority area is integrated climate-resilient production systems for enhancing soil health and building resilience to climate change. Innovations that combine improved crop varieties, soil and water management, and diversified farming systems respond directly to national and regional strategies aimed at stabilising production under climate stress (Kaushik et al., 2023; IFAD, 2023b). Bundling these interventions, rather than implementing single-practice solutions, helps smallholders manage climate variability and shocks more effectively. Complementing this, digital agriculture innovations remain a high-priority area. While digital tools for weather and pest forecasting, extension advice, and farm management are already in use, regional strategies emphasise the need for decision-support systems that are locally relevant, actionable, and inclusive, particularly for women and marginalized farmers (ASEAN).

38. Climate risk management and Early Warning Systems (EWS) are also critical. South and Southeast Asia face multiple climate hazards, including floods, cyclones, and droughts. Rapid advances in digital and space technologies have enabled real-time hazard

monitoring and community-level dissemination of early warnings. Integrating these systems with advisory services allows smallholders to make timely adaptation decisions at farm and community levels. The ASEAN assessment on Multi-Hazard End-to-End EWS highlights opportunities for innovation in hazard monitoring, information dissemination, and integration with digital extension platforms, ensuring actionable early warning for smallholders (ASEAN, 2024).

39. Agricultural insurance and risk management remain a critical area for innovation. According to a 2013 Swiss Re study, global agricultural insurance premiums nearly tripled, rising from USD 8 billion in 2005 to USD 23.5 billion in 2011, with India and the People's Republic of China accounting for 62 per cent of premiums in emerging markets (Swiss Re, 2013). Public-private partnerships between governments and private reinsurers have facilitated the development of innovative, commercially viable insurance products, including index-based insurance schemes that leverage remote-sensing technology for timely loss assessment and settlement (ADB, 2017). Despite these advances, uptake remains limited: high costs have prompted many middle-income countries to rely on substantial subsidies, yet these have generally failed to significantly expand coverage. As a result, overall penetration remains low, and large areas of cultivated land are left uninsured.

40. To address these challenges, combining parametric covers with comprehensive indemnity-based products has emerged as a promising strategy to improve coverage and reduce the limitations of traditional insurance (ADB, 2017). Additionally, mobile and satellite technologies can enhance efficiency by reducing moral hazard, improving the accuracy of risk assessment, building credible farm-level data sets, and lowering transaction costs (ibid). These innovations not only strengthen financial resilience for smallholder farmers but also provide a platform for scaling insurance solutions in diverse agrifood systems across the region.

41. Value-chain and post-production innovations are increasingly recognised as critical for building resilience of agrifood value chains. Digital technologies, including ICT-enabled market linkages, traceability systems, and post-harvest management solutions, are helping reduce losses, enhance product quality, and improve access to higher-value markets (FAO, 2022a). To scale effectively, these technologies must be implemented through viable business models, delivered via mobile platforms where possible, and guided by inclusive digital strategies that leave no farmer behind. Expanding digital infrastructure and building digital capabilities in that respect is crucial.

Pacific Island Countries

42. In the Pacific, climate-resilient production and resource management remain a priority due to high exposure to climate shocks, with innovations focused on water harvesting, efficient irrigation, and crop diversification key areas for innovation. Integrated approaches that combine nature-based solutions (NbS), such as mangrove restoration and coastal ecosystem management, are also essential to safeguard both livelihoods and ecosystem services (SPC, 2025).

43. Climate risk and EWS innovations are also crucial in the Pacific, given high vulnerability and limited infrastructure. Priority innovations include combining traditional knowledge with meteorological forecasts and disseminating information through local digital channels, supporting timely decisions for farming and disaster preparedness.

44. Post-production and market access innovations include ICT-enabled extension services,

mobile aggregation platforms, and cold-chain solutions for perishable produce, helping smallholders maintain food security while enhancing economic resilience (IFAD, 2025). Additionally, promoting Neglected and Underutilized Species (NUS), such as Pacific Island bananas, strengthens local food systems, improves nutrition, and provides income opportunities. Supporting NUS adoption offers a low-cost, climate-resilient strategy that simultaneously addresses dietary diversity, healthy diets, and local livelihoods (Burkhart et al., 2022).

Cross-cutting priorities

45. Across both Mainland Asia and the Pacific, the AFCIA programme can focus on systems-level innovations that integrate climate-smart agriculture, NbS, digital tools, finance, and traditional knowledge. Strengthening knowledge systems, evidence generation, and mechanisms for South–South and triangular cooperation is critical for adoption and replication beyond initial pilots. Embedding gender-responsive design, engaging youth, and including marginalized groups are essential to ensure equitable benefits and sustainable uptake.

Enablers and barriers for climate innovations in smallholder agriculture

46. The adoption and scaling of climate innovations for smallholder agriculture in Asia and the Pacific are shaped by a complex interaction of enabling conditions and persistent constraints. These factors cut across five interrelated domains: the policy and regulatory environment, finance and investment, research, knowledge and capacity, technology development and access, and socio-cultural and institutional dynamics. Together, they determine whether innovations can move beyond pilots to sustained, equitable impact at scale.

Policy and regulatory environment

47. National and regional policy frameworks, including the ASEAN Climate Resilience Network Framework (2026–2030) and the ASEAN Food, Agriculture and Forestry Sectoral Plan, provide an enabling foundation for climate-smart agriculture, nature-based solutions, and integrated approaches to adaptation. These frameworks help align priorities, guide public investment, and facilitate coordination across countries and institutions. At the same time, important gaps remain. In many contexts, dedicated policies to guide the use of digital technologies for climate adaptation are either absent or weakly articulated, limiting coherence across initiatives (UN ESCAP, 2021). Regulatory uncertainty around data governance, digital agriculture standards, and the validation of new tools can further slow adoption at local level. In addition, disaster risk reduction and climate adaptation policies are often fragmented across sectors, while traditional and Indigenous knowledge systems are insufficiently integrated into formal policy processes, reducing the relevance and legitimacy of innovations for smallholder communities.

Finance and investment

48. Limited access to finance continues to be a major barrier to smallholder uptake of climate innovations. Smallholders often face high borrowing costs, lack collateral, and have limited access to insurance and long-term investment capital for climate-smart technologies (ADB, 2017). While public–private partnerships and donor-supported programmes have introduced new financial instruments, uptake remains uneven due to affordability constraints, low financial literacy, and weak linkages between finance and advisory services. Microgrants and concessional finance can be effective in catalysing experimentation and early adoption, but sustained scaling requires financial products to be embedded within viable business models and supported by technical assistance. Risk-sharing mechanisms, including bundled parametric and indemnity-based insurance and

digitally enabled payment systems, can reduce investment risks for both farmers and service providers, particularly when linked to mobile platforms and geospatial data.

Research, knowledge, and capacity

49. Asia and the Pacific benefits from a strong ecosystem of research institutions, regional knowledge platforms, and innovation hubs, supported by organizations such as CGIAR, SEARCA, and regional initiatives under ASEAN and other cooperation frameworks. South–South knowledge exchange, including leadership from countries such as the Republic of Korea, has contributed to the diffusion of advanced technologies and management practices. However, persistent gaps remain in translating research outputs into solutions that are affordable, gender-responsive, and tailored to diverse smallholder contexts. Weak extension systems, limited integration of climate services into advisory platforms, and gaps in digital and climate literacy constrain awareness and adoption of innovations at farm level (UN ESCAP, 2021). Strengthening intermediary institutions and improving last-mile knowledge delivery remain critical enablers for scaling climate innovation.

Technology development and access

50. Technological advances in digital agriculture, remote sensing, and geospatial information systems offer significant potential to improve climate risk management, crop monitoring, and early warning systems (UN ESCAP, 2019). Yet these opportunities are unevenly distributed. Persistent digital divides—driven by limited connectivity, high costs of devices and services, low digital skills, and regulatory constraints continue to exclude many smallholders from benefiting from digital innovation. At the same time, gaps in the availability of high-resolution, timely, and locally relevant climate and agricultural data limit the effectiveness of decision-support tools (ADB, 2024b). Enabling adoption therefore requires not only technological development, but also investments in digital infrastructure, data systems, and user-centred design, combined with sustained training and technical support.

Socio-cultural and institutional factors

51. Beyond technical and financial considerations, behavioural and institutional factors strongly influence smallholders' willingness and ability to adopt climate innovations. Risk aversion, short planning horizons, reliance on traditional coping strategies, and low trust in formal institutions can reduce uptake of new practices and tools (ADB, 2017). Social norms and gender inequalities may restrict women's access to land, finance, and training, while young people often face structural barriers to participation in agricultural innovation systems. Insecure land tenure and lack of land ownership further shape farmer behaviour and attitudes toward long-term investment in climate-resilient practices (Tiemann and Douxchamps, 2023). Addressing these constraints requires strengthening local institutions, promoting participatory and peer-to-peer learning approaches, and ensuring that innovation pathways are inclusive, socially legitimate, and aligned with community priorities.

East and Southern Africa (ESA)

Climate context and implications for innovation

52. East and Southern Africa are situated in one of the most climate-vulnerable regions globally, where agricultural systems and rural livelihoods are highly sensitive to ongoing and projected climate change. Human-induced warming has already contributed to increased temperatures, more frequent and severe droughts, and pronounced variability in rainfall patterns across the region, undermining crop production, water availability, and livestock productivity, especially in areas dependent on rainfed agriculture, which accounts

for 95 per cent of cultivated land across sub-Saharan Africa (Trisos et al., 2022). Climate change has already reduced agricultural productivity growth in Africa by 34 per cent, more than in any other region, with yield declines observed for staple cereals such as maize and wheat in sub-Saharan contexts, and climate-related stressors including heat, drought and pests increasingly cited by farmers as drivers of yield losses (ibid).

53. These climate trends have direct implications for adaptation responses in smallholder agriculture as substantial declines are projected for staple crops without adaptation. First, the intensification of climate variability increases the urgency of developing and scaling climate-smart technologies and practices, such as agricultural diversification and growing drought-tolerant crop varieties, water harvesting and efficient irrigation systems, and integrated soil and water management techniques that can stabilize production under more erratic conditions. Second, the prevalence of climate shocks highlights the critical need for context-specific climate information and early warning systems that provide actionable forecasts to smallholders, enabling timely decisions on planting, input use, and risk mitigation. Third, as climate change continues to erode traditional coping strategies and raises the risks of food insecurity and livelihood loss, innovations in risk finance, insurance products tailored to smallholders, and bundled advisory services become essential to support resilience and investment confidence. According to estimates, insurance penetration is less than 2 per cent of GDP and 90 per cent of natural catastrophe losses were uninsured in Africa in 2018 leaving a large risk protection gap (Swis Re, 2019). Lastly, the growing impacts of climate change underscore the importance of ecosystem-based adaptation measures, such as agroforestry and integrated landscape management, which not only buffer climate risks but also enhance the long-term sustainability of agrifood systems in East and Southern Africa.

Current innovation landscape & major gaps

54. Across East and Southern Africa, climate-related innovations in smallholder agriculture span crop and livestock systems, climate information services, risk management tools, post-harvest and value-chain solutions, and nature-based approaches. While many of these innovations demonstrate clear potential to strengthen resilience, their adoption and scaling remain uneven, shaped by structural, institutional, and socioeconomic constraints.

55. Crop production and diversification remain central to the region's adaptation landscape. The development and dissemination of drought-tolerant crop varieties represent one of the most established innovation pathways, with institutions such as the International Institute of Tropical Agriculture (IITA) playing a leading role in breeding crops suited to increasing climate stress. Despite this progress, uptake among smallholders remains limited. Recent meta-analyses estimate adoption rates of drought-tolerant maize varieties across sub-Saharan Africa at only 11.2 per cent (Adechian et al., 2025). Barriers to adoption include limited access to information and training, affordability and availability of improved seed, inappropriate packaging sizes, weak labelling, and broader financial constraints faced by smallholders (Fisher et al., 2015). Alongside varietal improvement, crop diversification and integrated crop–livestock systems are widely practiced across ESA, reflecting long-standing strategies to spread risk, enhance productivity, and reduce vulnerability within smallholder systems.

56. Sustainable agricultural practices, including agroecological and conservation agriculture approaches, are also well represented in the innovation landscape. Practices such as intercropping, legume integration, mulching, and incorporation of crop residues are commonly promoted and adopted, particularly in southern Africa. Evidence links these practices to improved household food security and income outcomes, although impacts vary considerably depending on the specific practices adopted and how they are combined

(Makate et al., 2018; IFAD, 2017). Research from Malawi and Zimbabwe indicates that climate-smart agriculture (CSA) delivers greater productivity and resilience benefits when complementary innovations are bundled rather than implemented in isolation (Makate et al., 2018). Adoption and effectiveness are shaped by a range of contextual factors, including access to financial resources, information and extension services, education levels, land tenure security, and agroecological conditions (IFAD, 2017).

57. Climate information services and digital innovations have expanded rapidly in recent years, particularly in relation to short- and medium-term weather forecasting. Growing evidence suggests that access to timely climate information can improve farm-level decision-making and productivity. In Ethiopia, for example, the use of weather and climate information services has been associated with productivity gains in maize and wheat production (Tamru et al., 2025). However, access remains highly uneven, with low overall coverage pointing to weak last-mile delivery systems. These gaps underscore the importance of strengthening agricultural extension services to support not only access to climate information, but also farmers' capacity to interpret and apply it effectively at the farm level.

58. Climate and agricultural risk insurance represents another important, though still evolving, component of the innovation landscape. Advances in remote sensing and climate analytics have enabled the development of weather index insurance products, with early pilots implemented in countries such as Malawi, Kenya, and Ethiopia (Tadesse et al., 2015). Despite their potential, uptake among smallholders remains limited due to affordability constraints, basis risk, and limited trust in insurance mechanisms, particularly when payouts do not accurately reflect experienced losses (Elum et al., 2017; Weber, 2019). At the same time, the insurance landscape in Africa is evolving. The Agriculture and Climate Risk Enterprise (ACRE) has emerged as a leading innovator, partnering with local insurers, farmer organisations, and service providers across Kenya, Rwanda, and Tanzania, and increasingly beyond. By leveraging satellite data, digital platforms, and mobile money, ACRE has developed integrated risk management solutions that combine insurance with advisory services and livestock health support (GIZ, 2021). While these approaches have expanded coverage and helped build trust, challenges persist, including low literacy levels, limited smartphone access, and gaps in digital skills. To date, farmers in Kenya, Tanzania, and Rwanda have collectively spent over USD 181 million on insurance products, yet scaling remains contingent on reaching larger customer bases to sustain low premium levels (ibid).

59. Value-chain and post-harvest innovations are gaining prominence as responses to significant post-harvest losses (PHLs), which are further exacerbated by climate variability. In Kenya's dairy sector, where approximately two million smallholders depend on milk production, national milk losses are estimated at 7.3 per cent, with the majority occurring at farm level due to poor handling and storage (ILRI, 2020). Innovations such as solar-powered milk chilling systems developed by Savanna Circuit Tech address these losses by enabling safe transport from farm to collection centres (UNEP and FAO, 2022). While effective, expansion remains constrained by limited access to finance (ibid). Similar system-level approaches are emerging in fisheries, where innovators such as Adili Solar Hubs support marginalised fishing communities by establishing cold chains from harvest to market (ibid). These examples illustrate responses within specific value chains, but post-harvest losses remain widespread, reaching up to 50 per cent for fruits and vegetables and around 17 per cent for cereals and pulses (Rojas et al., 2024). A range of small-scale processing and storage technologies has been developed, yet documented cases of successful scaling remain limited, with notable exceptions such as the widespread adoption of hermetic storage bags and initiatives like YieldWise in the United Republic of Tanzania (AGRA, 2021; Rojas et al., 2024).

60. Livestock-related innovations increasingly leverage digital technologies to support pastoralists and small-scale producers, even in remote areas. Precision livestock farming (PLF) tools enable continuous monitoring of animal health, behaviour, and productivity, supporting real-time management decisions that can improve welfare, yields, and environmental performance (GIZ, 2021). Available technologies allow tracking of feed intake, movement, temperature, milk production, and weight gain. AfriScout provides one illustrative example, offering pastoralists in Kenya, Tanzania, and Ethiopia access to digital forage maps derived from satellite imagery and crowd-sourced Indigenous knowledge. By acting as a "shepherd's eye in the sky," the service supports climate-smart rangeland management and mobility decisions under increasingly variable climatic conditions (GIZ, 2021).

61. Marine and Coastal Management. Nature-based solutions (NbS) have emerged as key innovations to enhance both ecosystem resilience and the livelihoods of coastal communities. For example, mangrove restoration projects in Kenya and Tanzania not only protect shorelines from erosion and buffer against extreme weather events but also provide sustainable income through the sustainable harvesting of mangrove products and support local fisheries. Seaweed farming has also gained traction as a climate-resilient livelihood option that diversifies income for coastal smallholders and contributes to coastal protection and carbon sequestration (WRI, 2025).
62. Integrated coastal management approaches that combine NbS with digital and geospatial tools are increasingly being piloted. For instance, participatory mapping of coastal zones using satellite imagery and community knowledge supports the identification of areas most suitable for mangrove restoration or aquaculture development, while monitoring changes in shoreline and water quality (Trisos et al., 2022). Early warning and climate information systems tailored for coastal hazards further support adaptive decision-making for communities dependent on fishing and aquaculture (ibid).

63. Finally, integration of Indigenous knowledge systems remains a defining feature of the innovation landscape in ESA. Smallholder farmers have long relied on diversified livelihood systems, incorporating underutilised crops, livestock breeds, and insects adapted to local conditions (Jiri et al., 2017). Traditional farming systems, such as the Machobane system in Lesotho, have demonstrated effectiveness in maintaining soil fertility under changing climatic conditions (Mafongoya and Ajayi, 2017). Similarly, water-smart innovations including rainwater harvesting have been more successfully adopted and sustained where they align with Indigenous knowledge, local practices, and social institutions (Mbilinyi et al., 2005; Reij et al., 2013). These examples highlight the continued relevance of locally grounded knowledge in shaping resilient and culturally appropriate innovation pathways.

Priority innovation areas

64. The analysis of the current innovation landscape in East and Southern Africa indicates that many ongoing initiatives already target high-impact areas for climate adaptation. Prioritizing investment in these areas can accelerate adoption, improve resilience, and ensure alignment with national and regional strategies. These priorities are consistent with country-level adaptation objectives outlined in Nationally Determined Contributions (NDCs), National Adaptation Plans (NAPs), and regional frameworks such as the Southern African Development Community (SADC) Climate Change Strategy and Action Plan 2020-2030.

65. The livestock sector remains a cornerstone of many African economies, with rising demand for animal-source foods offering substantial opportunities for economic growth and employment in livestock value chains (GIZ, 2021). To capitalize on this potential, the sector must enhance productivity and expand value chains while addressing challenges such as

climate change, biodiversity loss, and resource degradation. Digital innovations are already transforming livestock management, enabling smallholders in remote areas to access information, modern inputs, services, and markets. Many ESA countries, including Ethiopia, Burundi, Kenya, Tanzania, and Rwanda, identify livestock productivity and climate-resilient practices as key adaptation priorities in their NDCs. Digital tools such as precision livestock farming (PLF) allow continuous monitoring of animal health, feed consumption, movement, and productivity, while digital forage maps, location-based veterinary services, and mobile-based insurance solutions help reduce risk and improve resilience (GIZ, 2021). Scaling these solutions requires supporting infrastructure, capacity building, and business models that facilitate affordability and accessibility for smallholder farmers.

66. Similarly, innovations in water management are essential for climate-resilient agriculture. Digital tools including satellite-based monitoring, open data platforms, and weather and climate information services support efficient allocation of scarce water resources, improve irrigation management, and provide actionable information to plan for droughts and floods. Yet, the effectiveness of these tools hinges on the ability to interpret, share, and apply data at the farm and community level. These approaches are emphasized in multiple NDCs and NAPs across the region, highlighting the importance of data interpretation, capacity building, and local dissemination mechanisms.

67. Integration of digital technologies to support sustainable, efficient, and data-informed farming practices more broadly in Africa remains limited, despite their potential to enhance crop productivity, improve food security, and strengthen climate resilience (FAO, 2021b). Precision agriculture (PA), for example, enables site-specific input application, real-time decision-making, and improved resource use efficiency. Initiatives like the African Agricultural Technology Foundation's (AATF) DroughtTEGO project in South Africa, Mozambique, Kenya, and Nigeria demonstrate how climate-resilient technologies can mitigate stressors such as drought and pests exacerbated by climate change (Muinga, 2019). PA can help bridge the gap between actual and attainable yields, providing targeted interventions for crop intensification through improved agronomic practices and decision-support tools. The African Union recognizes the adoption of PA as critical for achieving its vision of "the Africa we want" (Africa Union, 2015).

68. Nature-based solutions (NbS), such as wetland restoration, reforestation, sustainable grazing, and mangrove conservation, are increasingly recognized in national strategies for climate resilience. They deliver co-benefits for carbon sequestration, biodiversity, and livelihoods, with examples including Rwanda's Green Fund supporting forest and wetland restoration and South African ecosystem management programs (Collins et al., 2025). Investments that integrate NbS with livelihood support and digital monitoring tools can enhance both adoption and scalability.

69. Value-chain resilience remains a critical area for investment. Affordable storage, cold-chain solutions, and ICT-enabled market linkages reduce post-harvest losses, strengthen food security, and improve smallholder incomes (Rojas et al., 2024; UNEP and FAO, 2022). Coupling these interventions with scalable business models ensures that value-chain innovations can be sustained and replicated.

70. Integration of Indigenous Knowledge Systems (IKS) complements technology-driven interventions, particularly in water management, rangeland management, and low-input crop diversification. Investments that combine IKS with modern technologies can enhance uptake, local relevance, and long-term sustainability, aligning with the priorities expressed in national adaptation plans.

71. In summary, investment priorities in ESA should focus on both scaling innovations that have already demonstrated effectiveness in the landscape and testing new solutions within the thematic areas discussed. By linking these efforts to national and regional adaptation strategies, and combining digital, ecosystem-based, and knowledge-integrated approaches, the AFCIA programme can strengthen smallholder resilience while promoting the development of context-appropriate and innovative climate adaptation solutions.

Enablers and barriers for climate innovations in smallholder agriculture

72. The adoption and scaling of climate innovations in ESA are shaped by interacting financial, institutional, technological and socio-cultural factors. Evidence across the region shows that farmers are more likely to adopt and sustain multiple climate-smart agriculture (CSA) practices where enabling conditions, such as access to finance, secure land tenure, education and effective extension services are in place. These factors support the combination of innovations rather than isolated adoption, which is critical for building resilience to increasing climate variability and change (Makate et al., 2019).

73. Financing and institutional capacity remain among the most binding constraints. Between 2021 and 2022, climate finance mobilised for Africa covered only around 23 per cent of estimated annual needs to implement NDCs and meet 2030 climate goals (CPI, 2024). Adaptation-focused finance, including for nature-based solutions (NbS), remains limited and fragmented. Many countries face challenges in accessing international finance due to complex application processes, limited project preparation capacity and concerns related to creditworthiness and political risk. While investor interest in NbS is increasing, uncertainty around financial returns and weakly articulated business models continue to constrain private investment (Collins et al., 2025).

74. In the case of NbS, institutional and policy barriers further slow implementation. Limited technical capacity to design, implement and maintain NbS projects, combined with policy preferences for grey infrastructure, often reduces their prioritisation (ibid). Social factors including land tenure conflicts and insufficient community engagement can undermine project effectiveness and erode trust. At the same time, regional initiatives such as AFR100, the Great Green Wall, the Great Blue Wall and the West Africa Coastal Areas (WACA) programme provide important platforms for learning on governance, financing and implementation of ecosystem-based approaches, offering opportunities to strengthen knowledge exchange and institutional coordination (ibid).

75. Climate data and digital access. Digital technologies, including climate information services and precision agriculture (PA), have significant potential to strengthen climate resilience in smallholder agriculture in East and Southern Africa. In practice, however, adoption remains uneven and largely limited to countries and farming systems with stronger socio-economic and technological foundations (Njoroge et al., 2025). Advanced PA applications such as yield monitoring, variable-rate input application, auto-guidance systems, and digitally enabled irrigation management are mainly observed in South Africa and Kenya and in selected high-value horticultural systems in parts of Eastern and Southern Africa, despite broader constraints to widespread adoption (ibid).

76. Several interlinked demographic, economic, and technical barriers constrain wider uptake. Smallholder farmers in Africa are often older (i.e. over 60 years) and have limited formal education or exposure to digital tools, which reduces their capacity and willingness to adopt complex technologies (ibid). Low digital literacy, combined with minimal farm incomes,

further limits the feasibility of investing in PA innovations. Economically, the high cost of acquiring and maintaining PA equipment including hardware, software, data services, and training presents a major barrier (ibid). Most farming households operate on small plots with limited resources, restricted access to credit or institutional finance, and limited ability to benefit from economies of scale, undermining the cost-effectiveness of PA technologies (ibid).

77. These constraints are compounded by structural gaps in digital and climate data infrastructure. Internet connectivity remains low in many rural areas, and access to smartphones, computers, sensors, and remote sensing services is uneven (Krell et al., 2021). Although mobile phone ownership has expanded rapidly, smartphone penetration remains limited, particularly among women and farmers not affiliated with producer organizations (GSMA, 2016; Krell et al., 2021). Since many PA and climate information systems depend on reliable data transfer and connectivity, these infrastructure gaps significantly constrain their functionality and scalability. During this transition phase, multi-channel delivery models combining smartphone applications, SMS services, and community radio remain essential to ensure inclusive access to climate and agricultural advisory services (GIZ, 2021).

78. Knowledge, behavioural change and local institutions play a decisive enabling role. Digital advisory services and e-learning platforms offer cost-effective mechanisms to reach large numbers of farmers, yet few are tailored to livestock systems or integrated crop–livestock contexts (GIZ, 2021). Emerging approaches such as gamification and simulation-based learning show promise in addressing behavioural barriers such as risk aversion and short-term decision-making by helping farmers better understand future climate impacts (ibid). More broadly, the integration of local institutions and Indigenous knowledge systems can strengthen innovation uptake by enhancing trust, relevance and social legitimacy (Makate, 2020). Informal networks and community organisations have proven effective in disseminating information, building skills and supporting adaptation in countries such as Kenya and Zimbabwe, though their capacity often remains under-resourced (ibid).

West and Central Africa (WCA)

Climate context and implications for innovation

79. West and Central Africa (WCA) faces a climate reality that acts like a constantly moving target for smallholder agriculture: rising temperatures, shifting rainfall timing, longer and more intense heat waves, and an increasing risk of heavy rainfall events that trigger flooding and erosion in many locations. These trends shape not only what innovations are needed, but also whether they work reliably across different agro-ecological zones. (IPCC AR6 WGI Regional Fact Sheet: Africa; IPCC AR6 WGII, Chapter 9: Africa; WMO State of the Climate in Africa) A defining feature of this context is the region's heavy dependence on rainfed production. In West Africa, irrigated land is limited (around 5 per cent in the World Bank–FAO "Blueprint"), meaning most farmers remain exposed to rainfall variability, dry spells, and uncertain season onset. This makes "timing-sensitive" innovations (planting windows, short-cycle varieties, water harvesting, advisory services) especially valuable, but also raises the penalty for failure when forecasts, inputs, or services arrive late. (World Bank & FAO, 2021 "Blueprint for Strengthening Food System Resilience in West Africa")

80. In this setting, climate adaptation technologies can deliver meaningful benefits, but the evidence base emphasizes incremental, context-specific gains rather than universal, plug-and-play results. A major meta-analysis of crop model simulations finds that crop-level adaptation options such as changes in planting times, varieties, irrigation, and residue management increase simulated yields on average by ~7–15 per cent, with effectiveness varying by crop and region. (Challinor et al., 2014).

81. However, innovation effectiveness in WCA is strongly mediated by three factors:
    - **Climate–technology matching.** Innovations must align with the dominant risk profile of each zone: delayed onset and dry spells in Sahelian systems, waterlogging and flood pulses in inland valleys, salinity and storm surges in coastal belts, or erosion and intense downpours at forest margins. Where the match is weak (for example, advisory services that do not translate forecasts into specific farm actions), impacts shrink quickly. (IPCC AR6 WGII, Chapter 9: Africa; AGRHYMET seasonal services; WMO climate reports)
    - **Institutional delivery capacity.** Adoption and sustained performance are highest where meteorological services, extension systems, and farmer organisations operate as a connected "service chain" rather than separate islands. In WCA, weak last-mile extension and fragmented mandates frequently create a gap between climate information and farm-level decisions. (World Bank & FAO, 2021 "Blueprint"; WFP Climate Services Toolkit)
    - **Socio-economic constraints and risk appetite.** For resource-constrained smallholders, affordability and timing often matter as much as technical performance. Low-cost adjustments (for example, planting-date optimisation or improved storage) tend to spread more consistently, while higher-potential interventions (irrigation, mechanisation, cold chains) face scaling limits because of upfront costs, maintenance ecosystems, and finance barriers. Even where field experience shows strong yield potential for solar-powered drip irrigation in high-value horticulture, structural constraints can slow uptake. (World Bank & FAO, 2021 "Blueprint")

82. In WCA, climate change increases demand for adaptation innovation, but it also narrows the margin for error. The most robust pathways are those that bundle technologies into delivery-ready packages (seed + soil-water practices + climate advisories + finance + last-mile services), tailored by agro-ecology and designed for low-cost adoption and maintenance, rather than relying on single "silver bullet" solutions. (World Bank & FAO, 2021 "Blueprint"; IPCC AR6 WGII, Chapter 9: Africa)

Current Innovation landscape and major gaps

83. West and Central Africa (WCA) contains one of the world's most climate-exposed agrifood regions, spanning Sahelian drylands, Guinea–Sudan savannas, coastal mangrove belts, humid forest mosaics at the Congo Basin fringe, and Atlantic SIDS and island-like contexts. Across these landscapes, climate risks are intensifying: heat extremes and rainfall disruption in the Sahel, erratic rainfall and pest pressure in savannas, sea-level rise and salinity in coastal zones, heavier downpours and forest degradation in humid areas, and chronic water scarcity and disaster exposure in small islands. (IPCC AR6 Africa Chapter; IPCC AR6 Small Islands chapter; AGRHYMET Seasonal Bulletin; WMO State of the Climate in Africa 2021; UNCCD Global Land Outlook; UNEP SIDS reports; World Bank WACA).

84. The region's innovation landscape is broad and increasingly practical, with many adaptive practices already embedded in farmer and pastoralist strategies. In Sahelian systems, Farmer Managed Natural Regeneration (FMNR) and soil and water conservation practices (zaï pits, half-moons, stone bunds, contour ridges) are widely used and scaled in many areas, often functioning as "climate shock absorbers" for soils and moisture. (World Agroforestry FMNR Review; CILSS DESIRE Project) Across savanna and semi-humid zones, improved stress-tolerant varieties for maize, rice, cassava and legumes, inland valley rice water control, Farmer Field Schools (FFS), and hermetic storage have reached scale in multiple countries. (AfricaRice lowland rice; IITA cassava; FAO FFS; PICS

Network).

85. Alongside these established practices, newer “tech-enabled” and infrastructure innovations are expanding through pilots and early scaling. These include solar-powered pumping and micro-irrigation for vegetables and rice, digital advisory and market information services (SMS/IVR/radio platforms), and community-based early warning systems for droughts, floods and coastal storms. (World Bank Solar Irrigation in SSA; CTA “Digitalisation of African Agriculture”; WFP Climate Services Toolkit; WMO State of the Climate in Africa 2021).

86. Despite this breadth, the WCA innovation ecosystem remains uneven in reach and frequently fragmented across projects, sectors and geographies. Many solutions are implemented as stand-alone pilots (for example, climate services without finance, or irrigation without maintenance ecosystems), limiting durable scaling. This fragmentation is particularly visible across the Sahel where combined packages (FMNR + soil-water conservation + solar irrigation + climate risk finance) are not consistently assessed or institutionalized, weakening the case for policy and investment at scale. (World Bank Sahel programmes; CGIAR drylands).

87. Weather and climate information services represent a foundational gap. WCA benefits from regional agro-meteorological capacity, yet local rainfall, soil and groundwater data remain patchy, and forecasts are often not translated into hyper-local, actionable agronomic and pastoral advice. Where services exist via radio, SMS, IVR or community intermediaries, coverage and usability can be constrained by low literacy, language diversity, and weak last-mile extension. (AGRHYMET; WFP Climate Services Toolkit; CGIAR CCAFS; GSMA Mobile Gender Gap Report).

88. A second bottleneck is adaptation finance and insurance. Index and parametric insurance for crops and pastoralists is emerging (including ARC Replica and WFP R4), but remains limited in coverage and often disconnected from credit, advisory services, and farmer organisations that could drive uptake. High upfront costs for irrigation, storage and mechanisation, combined with limited collateral and insecure tenure, restrict climate-resilient investment, especially for women and youth. (African Risk Capacity; WFP R4; IFAD Rural Finance Policy; IFAD Targeting Policy; UNCCD Global Land Outlook).

89. Seed and input systems remain another systemic constraint. While stress-tolerant varieties exist for Sahel staples (millet, sorghum, cowpea) and for maize, rice and cassava in savanna and coastal systems, seed systems are frequently fragmented, with constraints in early-generation seed supply, quality control, and delivery to remote areas. (CORAF Seed Systems Report; AfricaRice; IITA cassava).

90. Value chains, post-harvest systems, and rural logistics are persistent pinch points. Hermetic storage and small processing are scaling in some places, yet cold chains, feeder roads, and aggregation infrastructure remain weak, raising costs and reducing incentives to adopt resilience practices linked to markets. In coastal zones, innovations like solar cold rooms and ice-making for fisheries show promise but remain largely pilot-stage, with maintenance and financing challenges. (World Bank Rural Access Index; UNIDO fisheries cold chain; PICS Network).

91. Several sub-regions face “cross-sector” gaps that slow integrated resilience. Coastal and mangrove belts often lack coordinated planning that links agriculture, fisheries and coastal

zone management, while humid forest landscapes face high transaction costs and weak smallholder access to deforestation-free supply chains and long-gestation agroforestry finance. (World Bank WACA; WWF sustainable cocoa reports; IFC agriculture finance; Congo Basin State of Forests).

92. Across WCA, barriers linked to insecurity, conflict and governance further constrain innovation. In parts of the Sahel and forest-border areas, insecurity disrupts extension services, discourages private investment, and complicates pastoral mobility and corridor governance. (OCHA Sahel Overview; FAO Pastoralism Hub).

93. Digital divides cut across all zones. Mobile coverage is expanding, but affordability, low digital literacy (especially among women and older farmers), and limited local capacity to interpret data weaken the farm-level impact of digital tools. (GSMA Mobile Economy SSA; GSMA Mobile Gender Gap Report; CTA "Digitalisation of African Agriculture")

94. In summary, WCA has no shortage of adaptive practices or promising innovations. The central challenge is turning a patchwork of pilots, sector silos, and uneven access into integrated, scalable systems that bundle climate information, finance, resilient production, post-harvest infrastructure, and inclusive institutions, tailored to distinct landscapes from the Sahel to the coast to forest mosaics and islands. (IFAD ASAP+; CILSS; AGRHYMET)

Priority innovation areas

95. Priority innovation areas in WCA reflect the need for integrated "resilience bundles" that match specific agro-ecologies, climate hazards, and market realities. Across sub-regions, the most effective pathways are those that combine climate information services, risk finance, resilient seed and soil-water systems, and market-linked post-harvest solutions rather than promoting single technologies in isolation. (CGIAR drylands; WFP Climate Services Toolkit; IFAD Rural Finance Policy)

96. Weather and climate information services are a first-order priority. WCA needs hyper-local agro-climatic advisories delivered through low-cost channels (SMS, IVR, WhatsApp, radio) and anchored in community intermediaries, especially in low-literacy contexts. These services are most valuable when paired with community-based early warning systems for drought, heatwaves, flash floods and coastal storms, and when they integrate traditional indicators with scientific forecasts. (WFP Climate Services Toolkit; AGRHYMET Seasonal Bulletin; WMO State of the Climate in Africa 2021)

97. Integrated crop–pest–climate early warning is a second priority, particularly for maize, rice and cassava systems facing rising pest and disease pressure (including Fall Armyworm). Linking pest surveillance to extension and FFS platforms can convert warnings into action, reducing yield shocks and pesticide misuse. (FAO Fall Armyworm; FAO FFS; WMO Africa climate reports)

98. Adaptation finance and insurance solutions remain pivotal for scaling. Priority innovations include drought, flood and fodder-deficit parametric/index insurance for farmers and pastoralists, bundled savings–credit–insurance products delivered via cooperatives and women's groups, and climate-risk scoring tools using satellite vegetation indicators and transaction histories to unlock micro- and meso-finance. In relevant contexts, Sharia-compliant climate finance tools can improve reach and legitimacy. (African Risk Capacity; WFP R4; IFAD Rural Finance Policy).

99. Crop production priorities focus on stress-tolerant varieties and regenerative soil-water systems adapted to each zone: short-cycle millet/sorghum/cowpea for the Sahel; improved maize/rice/cassava/plantain for savanna, coastal and humid systems; and drought-tolerant horticulture options in islands. These should be packaged with soil health approaches (mulching, composting, manure management, cover crops, biochar) and proven erosion and water-harvesting structures. (CORAF Seed Systems Report; AfricaRice; IITA cassava; CILSS DESIRE Project; FAO water harvesting)

100. Small-scale irrigation and water-smart intensification is a major lever, especially through local manufacture/assembly and repair ecosystems for low-cost drip kits, solar pumps, and inland valley rice water control. Building local fabrication and maintenance capacity is itself an innovation priority, reducing import dependence and downtime. (World Bank Solar Irrigation in SSA; World Bank productive use of energy; AfricaRice lowland rice).

101. Low-emission management systems are increasingly relevant in mixed crop–livestock landscapes. Priority innovations include silvopastoral systems and rangeland regeneration, biodigesters that convert manure and residues into biogas and organic fertiliser, and improved feed and herd health to reduce methane intensity. Climate-smart rice options (alternate wetting and drying, improved drainage, straw management) are priorities in inland valleys. (FAO Pastoralism Hub; ILRI mixed farming; AfricaRice lowland rice).

102. Value chains, market access and traceability priorities focus on "low-data" tools and cooperative-based aggregation models: digital platforms linking farmers to buyers, e-commerce microstores for cooperatives and women-led enterprises, offline-capable traceability for cocoa/coffee/NTFPs/livestock, and mobile aggregation points to reduce transaction costs in remote Sahelian and forest-edge zones. (CTA "Digitalisation of African Agriculture"; WWF sustainable cocoa reports; CIFOR community forestry).

103. Post-production and storage solutions are essential for stabilizing incomes under climate volatility. Priorities include hermetic storage with digital stock management, small-scale agro-processing for cassava, cereals, oilseeds, shea and NTFPs, plus solar-powered cold rooms and mini cold chains for fisheries, vegetables, dairy and meat, especially in coastal belts. (PICS Network; UNIDO fisheries cold chain; UNIDO energy in agro-processing).

104. Nature-based and ecosystem solutions should be scaled as core resilience infrastructure: FMNR and assisted natural regeneration in Sahel and savannas, smallholder agroforestry in humid forest mosaics, mangrove restoration and integrated mangrove–rice–fish systems in coastal zones, and watershed restoration in inland valleys and uplands. These must be paired with incentives and governance that make restoration economically durable for communities. (World Agroforestry FMNR Review; CIFOR–ICRAF agroforestry; IUCN mangrove initiatives; World Bank WACA)

Enablers and constraints

105. WCA's capacity to scale climate-resilient innovation is shaped by interacting policy, finance, knowledge systems, technology access, and socio-institutional dynamics. The region has strong enabling assets, but persistent structural barriers continue to limit inclusive uptake, particularly for women, youth, pastoralists, and communities in remote or insecure areas. (IFAD ASAP+; GSMA Mobile Gender Gap Report; OCHA Sahel Overview).

106. Policy and regulatory environment. Enabling conditions include regional climate and agro-meteorological institutions (CILSS, AGRHYMET) and the growing presence of national climate and agriculture strategies that create entry points for mainstreaming CSA, climate services, and landscape restoration. However, fragmented mandates and weak coordination between agriculture, water, meteorology and finance actors commonly impede integrated delivery, especially for coastal zone management linking agriculture and fisheries. Tenure insecurity and unclear rights over cropland, rangelands, and mangrove areas reduce incentives for long-term investments in trees, soil restoration, and shared infrastructure. (CILSS; AGRHYMET; World Bank WACA; UNCCD Global Land Outlook; FAO land tenure resources).

107. Finance and investment. Major constraints include high upfront costs for irrigation, mechanisation and storage, limited collateral, and thin rural financial products tailored to climate risk and long-gestation systems (agroforestry, tree-crop rehabilitation). At the same time, large adaptation portfolios (including IFAD ASAP+ and other partners) and emerging index insurance initiatives provide pathways for scaling bundled products and blended finance that combine advisory services, insurance, and investment credit. (AfDB agriculture; IFAD Rural Finance Policy; IFC agriculture finance; IFAD ASAP+; African Risk Capacity; WFP R4).

108. Research, knowledge and capacity. WCA benefits from regional R&D networks (CORAF/WECARD) and commodity research leadership (for example AfricaRice and IITA), plus strong community knowledge in dryland soil-water management, pastoral mobility, mangrove ecosystems, and forest-based livelihoods. The binding constraint is last-mile capacity: under-resourced extension services, limited local analytics for actionable climate advice, and insufficient documentation of scalable pastoral and integrated landscape models. (CORAF; AfricaRice; IITA cassava; FAO Pastoralism Hub; AGRHYMET).

109. Technology development and access. Expanding mobile penetration and digital services are strong enablers, but connectivity gaps, affordability barriers, and limited digital literacy reduce effectiveness, especially for women and older farmers. Local manufacturing and repair ecosystems for solar pumping, small mechanisation, cold-chain equipment and desalination (in islands) remain underdeveloped, increasing lifecycle costs and system failure risk. (GSMA Mobile Economy SSA; GSMA Mobile Gender Gap Report; World Bank productive use of energy; IRENA renewables in SIDS).

110. Socio-cultural and institutional factors. Strong farmer organisations, cooperatives, women's groups in processing and marketing, and community-led restoration traditions provide powerful platforms for scaling bundled innovations. Constraints include gender inequalities in land and finance, risk aversion under chronic food insecurity, youth outmigration, and insecurity in some zones that disrupts services and market functioning. Building youth-led rural service enterprises (mechanisation, advisory, aggregation, repair) can convert constraints into capacity and jobs, while improving resilience delivery at scale. (IFAD COSOPs; IFAD gender analyses; WFP Sahel; OCHA Sahel Overview; CTA "Digitalisation of African Agriculture").

Latin America and the Caribbean (LAC)

Current Innovation landscape and major gaps

111. Latin America and the Caribbean (LAC) hosts one of the most diverse and dynamic agrifood innovation landscapes among developing regions. The region benefits from

strong agricultural research systems, an expanding agritech ecosystem, and increasing political attention to climate-smart agriculture, nature-based solutions, and the bioeconomy. Countries such as Brazil, Mexico, Colombia, Peru, Argentina, and Costa Rica have developed national strategies supporting digital agriculture, regenerative production, and low-emission food systems, creating an enabling backdrop for innovation (FAO, 2022; IFAD, 2024).

112. Across the region, climate-relevant innovations are present along the entire agrifood system. Climate-resilient crop varieties, conservation agriculture, agroforestry and silvopastoral systems, solar-powered irrigation, digital climate advisory services, and early warning systems have all been piloted or scaled to varying degrees. Regional and international research institutions have generated a substantial evidence base on climate-resilient crops, soil management, and ecosystem-based adaptation, while Indigenous and traditional knowledge systems continue to underpin resilient production practices in the Andes, Amazon Basin, Mesoamerica, and the Caribbean (CGIAR, 2023; FAO, 2022).

113. Despite this breadth, the innovation landscape remains highly fragmented and uneven in its reach. Many climate adaptation solutions exist as isolated pilots or donor-funded projects, with limited institutionalization within national extension systems, financial mechanisms, or public investment programmes. As a result, successful innovations often fail to transition from proof-of-concept to sustained scaling, particularly in remote, marginal, or conflict-affected rural areas.

114. One of the most significant gaps lies in weather and climate information services. While regional climate monitoring capacity is relatively strong, climate information is often not translated into localized, actionable advisories tailored to smallholder decision-making. Agro-climatic advisories delivered via SMS, WhatsApp, radio, or community platforms are expanding, yet coverage remains patchy in mountainous, forested, coastal, and island contexts where connectivity and extension services are weakest (IFAD, 2022; FAO, 2022). Community-based early warning systems for floods, droughts, hurricanes, and landslides are unevenly developed and frequently disconnected from farm-level response mechanisms (WMO, 2023).

115. Adaptation finance and insurance represent a second major bottleneck. Although LAC is home to some of the world's most advanced disaster risk financing mechanisms at sovereign and regional levels, including parametric insurance facilities, these instruments rarely reach small-scale farmers directly. Farmer-level index and parametric insurance schemes remain limited in scale, narrowly targeted to specific crops, and often unaffordable for poorer households (IDB, 2022; World Bank, 2021). Access to credit for climate-resilient investments is constrained by land tenure informality, lack of collateral, and high perceived risk, particularly for women, youth, Indigenous Peoples, and Afro-descendant communities. Blended finance instruments for regenerative agriculture and forest-positive production are emerging but are still largely inaccessible to smallholders due to complex requirements and weak aggregation mechanisms (IDB, 2022).

116. In crop and livestock production systems, innovation has advanced most rapidly in commercial and semi-commercial contexts, while smallholders in marginal environments lag behind. Climate-resilient varieties of staple and cash crops are increasingly available, yet seed systems remain fragmented and slow regulatory processes delay the release and dissemination of new varieties (CGIAR, 2023). Irrigation, soil health technologies, and low-emission livestock practices are well documented but often remain out of reach for small-scale farmers due to high upfront costs, limited technical support, and insufficient maintenance ecosystems (FAO, 2021; FAO, 2022).

117. Value-chain, market access, and traceability innovations are expanding rapidly in response to sustainability and deforestation-free supply chain requirements. Digital market platforms, blockchain-based traceability, and certification schemes for coffee, cacao, beef, fruits, and fisheries are increasingly common (IDB Lab, 2023; IFAD, 2024). However, these systems are frequently designed for larger producers and exporters, imposing transaction costs and compliance burdens that exclude smallholders. Weak rural logistics, cold chains, and aggregation infrastructure further limit participation in climate-resilient markets, particularly in remote Amazonian, Andean, and island territories (FAO, 2022; Caribbean Development Bank, 2023).

118. Post-harvest losses remain a persistent vulnerability across LAC, exacerbated by climate extremes and rising temperatures. While solar-powered cold storage, packhouses, and small-scale agro-processing units have demonstrated strong impacts on income stability and food security, coverage remains limited and largely project-based (FAO, 2022). Maintenance, energy access, and financing constraints continue to impede wider adoption.

119. The region has a strong foundation in nature-based and ecosystem solutions, including agroforestry, mangrove restoration, watershed management, and silvopastoral systems. These approaches are increasingly reflected in national climate strategies and restoration commitments. However, their scaling is constrained by insecure land tenure, weak recognition of collective and Indigenous land rights, and insufficient integration with finance, markets, and climate information systems (FAO, 2022; IFAD, 2023).

120. Finally, while digital and data infrastructure is expanding rapidly, significant divides persist. Smartphone penetration is rising, open-source geospatial platforms are widely used, and remote sensing is increasingly applied to monitor fires, deforestation, and land degradation (CGIAR Digital Innovation, 2023; SERVIR Amazonia, 2022). Yet rural connectivity gaps, low digital literacy among older farmers and women, and limited local capacity to interpret and act on data reduce the effectiveness of digital solutions at farm level.

121. Across all domains, a critical systemic gap remains the insufficient integration of traditional and Indigenous knowledge into formal innovation systems. Agroforestry systems such as the Amazonian chakra, ancestral water management systems (amunas, camellones), and participatory seed networks are proven adaptation strategies, yet they are rarely embedded in policy frameworks, digital platforms, or finance mechanisms (FAO, 2022; IFAD, 2023). As a result, innovation pathways often overlook culturally grounded solutions that are already adapted to climate variability.

122. In summary, while LAC possesses a rich and diverse climate innovation ecosystem, the central challenge lies not in the absence of solutions but in the fragmentation, inequitable access, and limited scaling of existing innovations. Addressing these gaps requires integrated approaches that bundle climate information, finance, production technologies, ecosystem management, and inclusive institutions, with a deliberate focus on small-scale farmers and climate-vulnerable territories.

Priority Innovation Areas

123. Priority innovation areas in LAC reflect the need to address highly diverse climate risks while overcoming persistent structural barriers faced by small-scale farmers. Across sub-regions, effective climate adaptation increasingly depends on integrated innovation

packages that combine climate information, finance, production systems, ecosystem management, and inclusive value chains, rather than stand-alone technologies.

124. Weather and climate information services are a foundational priority across LAC. Climate variability linked to droughts, floods, hurricanes, landslides, and heat stress is intensifying, particularly in the Dry Corridor, the Andes, Amazonia, and Caribbean SIDS. Localized agro-climatic advisories delivered through low-cost digital channels such as SMS and WhatsApp have proven effective in reaching dispersed smallholders, especially where formal extension services are weak (IFAD, 2022; FAO, 2022). These services are most impactful when combined with community-based early warning systems that translate forecasts into locally actionable responses for extreme events (WMO, 2023). Emerging AI-based climate risk and landslide forecasting models, drawing on satellite and geospatial data, offer significant potential to improve anticipatory action in mountainous and forested landscapes, though their application at smallholder scale remains limited (WMO, 2023).

125. Adaptation finance and insurance solutions represent a critical bottleneck for innovation uptake. Climate risks in LAC are increasingly systemic, yet most smallholders lack access to affordable risk-transfer and long-term investment finance. Parametric and index-based insurance schemes for hurricanes, droughts, and excess rainfall are expanding, particularly in coffee, horticulture, and livestock systems, but coverage remains partial and premiums often unaffordable for poorer farmers (IDB, 2022; World Bank, 2021). Priority innovations therefore include bundled financial products that integrate credit, insurance, and climate advisory services through cooperatives and rural financial institutions, as well as climate-risk scoring tools using mobile and satellite data to reduce information asymmetries and lending risk. Blended finance instruments targeting regenerative and forest-positive agriculture are also emerging as a strategic entry point to crowd in private capital, though they require concessional support to reach small-scale producers (IDB, 2022).

126. In crop production systems, innovation priorities focus on enhancing resilience to heat, drought, excess rainfall, and pest pressures while supporting diversification and nutrition. Climate-resilient varieties of maize, beans, cassava, coffee, and cacao are increasingly available, yet access remains uneven, particularly in remote and Indigenous territories (CGIAR, 2023). Diversification with neglected and underutilized species such as quinoa, amaranth, tarwi, açaí, and guayusa offers strong adaptation and income potential, especially in Andean and Amazonian systems, but value chains remain underdeveloped (FAO, 2021). Affordable solar-powered and gravity-fed drip irrigation systems are a priority in dry and hillside regions, alongside regenerative soil management practices including composting, biofertilizers, and biochar, which improve water retention and resilience to climate shocks (FAO, 2021).

127. Low-emission management systems offer a dual opportunity for adaptation and mitigation in mixed crop–livestock landscapes. Silvopastoral systems and rotational grazing are increasingly recognized as effective strategies to reduce heat stress, improve forage availability, and restore degraded land, particularly in Central America, the Southern Cone, and parts of Brazil (FAO, 2022). Complementary innovations include manure biodigesters and methane-reducing feed additives, as well as traceability tools supporting deforestation-free livestock production. However, scaling remains constrained by high upfront costs and limited access to tailored finance for smallholders (FAO, 2022).

128. Strengthening value chains, market access, and traceability is essential to translate climate resilience into sustainable livelihoods. Digital market-linkage platforms and e-commerce microstores for cooperatives and women-led enterprises are expanding,

reducing transaction costs and improving price transparency (IFAD, 2024; IDB Lab, 2023). Blockchain-based traceability systems for coffee, cacao, beef, and fruit are increasingly driven by deforestation-free and sustainability requirements, yet smallholders often struggle to comply with complex standards. Simplified eco-labelling and certification schemes adapted to small-scale contexts are therefore a priority to enable inclusive participation in climate-resilient markets (IFAD, 2024).

129. Post-production and storage solutions address a major climate vulnerability in LAC, where extreme weather and rising temperatures exacerbate post-harvest losses. Solar-powered cold rooms, cooperative-managed cold chains, and small-scale agro-processing units such as coffee washing stations, cacao fermentation facilities, and fruit pulping units are proven innovations that enhance income stability and food security, particularly for horticulture, fisheries, and high-value crops (FAO, 2022; Caribbean Development Bank, 2023).

130. Nature-based and ecosystem solutions are central to long-term climate resilience in the region. Community-led agroforestry systems based on cacao, coffee, açaí, and Brazil nut production are well established in parts of Amazonia and Central America, combining adaptation, biodiversity conservation, and income generation (FAO, 2021). Mangrove restoration and coastal buffer systems are critical for Caribbean and coastal resilience, while terracing, contour farming, and watershed management in the Andes reduce erosion, landslide risks, and water scarcity. Scaling these approaches requires integration with finance, land tenure security, and climate information systems.

131. Finally, digital and data infrastructure underpins innovation across all areas. IoT sensors for crop, soil, and water monitoring, integrated farm–climate–market data platforms for cooperatives, and remote sensing for fire, deforestation, and land degradation monitoring are expanding rapidly, supported by open-source platforms and regional initiatives (CGIAR Digital Innovation, 2023; SERVIR Amazonia, 2022). Ensuring these tools are accessible, low-cost, and adapted to low-connectivity environments remains a priority.

132. Across all innovation areas, the integration of traditional and Indigenous knowledge emerges as a cross-cutting priority. Amazonian chakra agroforestry systems, the revival of ancestral water management systems such as amunas and camellones, and participatory seed-saving networks linking native and climate-resilient varieties represent proven adaptation strategies that are increasingly being combined with digital mapping and hydrological modelling (IFAD, 2023; FAO, 2022). Embedding these systems into formal innovation and finance pipelines is essential to ensure culturally appropriate, scalable, and equitable climate resilience outcomes.

Enablers and Constraints

133. The capacity of LAC to scale climate-resilient innovations for smallholder agriculture is shaped by a complex interaction of policy, finance, knowledge systems, technology access, and socio-institutional dynamics. While the region benefits from strong institutional assets and growing political momentum around climate action, persistent structural barriers continue to limit the reach and sustainability of innovation, particularly for women, youth, Indigenous Peoples, and Afro-descendant communities.

134. Policy and regulatory environment; Policy frameworks in LAC increasingly recognize agriculture as central to climate adaptation and ecosystem restoration. Many countries have strengthened their Nationally Determined Contributions (NDCs) to include climate-smart agriculture (CSA), nature-based solutions (NbS), and low-emission food systems. Policy momentum around regenerative agriculture and the bioeconomy is

particularly evident in Brazil, Colombia, and Costa Rica, supported by public incentives for restoration, agroforestry, and sustainable land use. In parallel, several countries have launched national digital agriculture strategies, creating entry points for scaling climate information services and data-driven innovation. Despite this progress, regulatory fragmentation remains a major constraint. Agricultural, climate, water, and land-use policies are often poorly coordinated, and decentralized implementation is weak, limiting the translation of national commitments into local action. Land tenure informality persists across much of the region, especially among Indigenous and Afro-descendant communities, reducing incentives for long-term investment in trees, soil restoration, and water infrastructure. Regulatory gaps in digital agriculture, climate data governance, and carbon measurement, reporting, and verification (MRV) further constrain the development of inclusive digital and market-based solutions. In addition, slow and complex procedures for registering new climate-resilient seed varieties and bio-inputs delay farmers' access to critical adaptation technologies.

135. Finance and investment; Financial systems in LAC present both significant barriers and important opportunities for climate innovation. On the constraint side, high insurance premiums and limited availability of parametric and index insurance products restrict risk management options for smallholders. Access to credit remains highly uneven, particularly for women, youth, and Indigenous farmers, due to lack of collateral, informal land tenure, and high perceived climate risk. Long-term concessional finance for irrigation, solar energy, post-harvest infrastructure, and agroforestry transitions remains scarce, while carbon markets and biodiversity finance are still insufficiently developed to provide reliable income streams for small-scale producers. At the same time, several enabling trends are emerging. Index insurance pilots for coffee, horticulture, and livestock systems are expanding, providing valuable learning on risk transfer mechanisms. Digital credit scoring using mobile phone data and remote sensing is reducing information asymmetries and transaction costs, opening new pathways for inclusive rural finance. Blended finance facilities and climate funds are increasingly supporting CSA and agroforestry investments, while strong microfinance institutions and cooperative-based financial systems in the Andes and Central America offer scalable platforms for delivering bundled finance, insurance, and advisory services.

136. Research, knowledge, and capacity; LAC benefits from a robust research and knowledge base, with strong national agricultural research institutions such as EMBRAPA, INTA, INIA, and INIFAP, complemented by CGIAR centers and regional climate platforms. Indigenous knowledge systems related to agroforestry, water harvesting, seed diversity, and landscape management represent a major adaptive asset, particularly in the Andes, Amazon Basin, Mesoamerica, and the Caribbean. University–community partnerships and agroecology networks are expanding, creating opportunities for co-design and locally grounded innovation. However, significant capacity gaps persist at the last mile. Extension systems remain weak or under-resourced in Amazonian, Caribbean, and highland regions, limiting farmers' access to climate information and technical support. Digital literacy gaps, particularly among older farmers and women, constrain the effective use of digital tools. Localized climate data and analytics capacity is limited, reducing the relevance of climate services for farm-level decision-making. Research gaps remain in areas such as low-emission livestock systems and drought-resistant crops suited to tropical and semi-arid conditions.

137. Technology development and access; Technological innovation in LAC is accelerating, supported by expanding agritech ecosystems in Brazil, Mexico, Colombia, and Peru, and by the growing availability of open-source geospatial platforms such as SEPAL, MapBiomas, and SERVIR. Rising smartphone penetration is enabling wider access to digital advisory services, while off-grid solar markets are expanding rapidly for

irrigation, cooling, and agro-processing. Nevertheless, access to technology remains highly unequal. High upfront costs for irrigation, solar energy, precision agriculture tools, and cold chain equipment limit adoption among smallholders. Rural connectivity gaps persist in Amazonian, Caribbean, and mountainous zones, undermining digital solutions. Weak local repair and maintenance ecosystems for imported technologies reduce long-term sustainability, while limited availability of certified climate-resilient seeds constrains farmers' adaptation options.

138. Socio-cultural and institutional factors; Socio-cultural and institutional dynamics strongly influence the uptake of climate innovation. Gender inequalities in land ownership, access to finance, and digital tools remain pervasive, while social norms often limit women's participation in training, leadership, and innovation processes. Risk aversion toward unfamiliar technologies is common in contexts of chronic poverty and climate exposure, and youth outmigration from rural areas reduces the availability of labor and local innovation capacity. At the same time, the region benefits from strong social and institutional enablers. Cooperatives and producer organizations play a critical role in aggregating demand, delivering services, and facilitating market access, particularly in Brazil, Guatemala, and Peru. Indigenous agroecological systems such as milpa, chakra, and terracing demonstrate high levels of resilience and adaptive capacity. Youth-led agritech entrepreneurship is growing across the region, and South–South cooperation platforms are increasingly facilitating the exchange of climate-smart agriculture and agroforestry innovations.

Near East, North Africa, Europe and Central Asia (NEN)

Climate context and implications for innovation

139. The Near East, North Africa, Europe and Central Asia (NEN), as defined by IFAD, encompasses a highly diverse set of agroecological zones, socio-economic contexts, and livelihood systems. Across the region, climate change is intensifying existing structural challenges for rural populations and smallholder producers, shaping both vulnerability patterns and adaptive responses. To better reflect this diversity and capture distinct climate risks and innovation dynamics in smallholder agriculture, this analysis considers two sub-regions: the Middle East and North Africa (MENA) and Europe and Central Asia (ECA).

140. The MENA region is characterized by acute and interconnected climate risks, including extreme water scarcity, rising temperatures, and increasing land degradation. It is the most water-stressed region globally, and climate change is further undermining water security, land sustainability, food systems, and ecosystem services. Agriculture in MENA is predominantly rainfed, accounting for approximately 70 per cent of cultivated land, making smallholder production systems particularly exposed to climate variability and extremes. The sector remains a major source of employment and income in many countries. Heat stress and recurrent droughts already affect roughly one-third of the region's land area, with direct consequences for crop and livestock productivity. These biophysical pressures are compounded by governance deficits, limited regional cooperation, weak market integration, and substantial shortfalls in adaptation finance, all of which constrain the region's capacity to manage transboundary climate risks and scale effective adaptation solutions (Knaepen, 2024).

141. In Europe and Central Asia (ECA), climate change is progressing at an accelerated pace. According to the World Meteorological Organization, the region is warming at approximately twice the global average rate. Rising temperatures, shifting precipitation patterns, and increasing climate variability are affecting sub-regions in uneven ways, with

significant implications for agrifood systems. Crop yields and livestock health are increasingly threatened by heat stress, water scarcity, and the growing prevalence of pests and diseases, while soil degradation and declining water availability further undermine productivity. Extreme weather events, including droughts, floods, and storms, are becoming more frequent and severe, affecting agricultural output across cropping, livestock, and fisheries systems. Climate-driven changes in ocean temperatures and freshwater ecosystems are also altering fish stocks and distribution patterns. Collectively, these impacts pose significant risks to the livelihoods and food security of millions of smallholders, farmers, fishers, women, and young people who depend on climate-sensitive sectors for income and nutrition.

Current innovation landscape & major gaps

Middle East and North Africa

142. In MENA, the current innovation landscape is strongly shaped by chronic water scarcity, rising temperatures, and land degradation. As a result, most climate adaptation innovations focus on water management, climate-resilient production systems, and risk information.

143. Water-related innovations are among the most advanced and widely implemented and include modernising irrigation technologies, monitoring water use, increasing on-farm water productivity and reducing losses in agricultural supply chains (Borgomeo et al. 2018). technologies such as drip irrigation have been proven to be more efficient than surface irrigation, reducing water consumption and increasing land productivity. According to Kuper (2024), efficiency scores of drip irrigation systems and surface irrigation are 90 per cent and 50 per cent respectively (as cited in Messaoudi et al, 2025). In several countries, these irrigation technologies have moved beyond pilot stages and are being scaled through public subsidy programmes (Morocco) and donor-supported investments, although adoption remains uneven among smallholders.

144. At the same time, traditional water management systems and irrigation practices across the region, including underground water canals, rainwater harvesting practices, and participatory water resource management also offer valuable insights to addressing water scarcity and building the climate resilience of communities in arid and semi-arid landscapes. The effectiveness of these traditional practices is increasingly being recognised and there are efforts across the MENA region to revive traditional irrigation practices. For example, water harvesting systems, known as Meskat in Tunisia are used to grow olive trees. In contrast to modern irrigation technologies that require higher upfront investments, reliable access to energy and specialized equipment, traditional systems utilize locally available materials and can be maintained using the skills present in the farming communities, helping preserve the cultural heritage that is tied to them (Hassen et al, 2025).

145. In parallel, ICARDA and national research systems have supported the development and dissemination of drought- and heat-tolerant varieties of cereals and legumes adapted to dryland conditions, with varying degrees of uptake depending on seed system functionality. For example, new drought-tolerant varieties of durum wheat, barley and lentils that have been tested in situ across different agroclimatic conditions revealing adaptation to climatic stresses and value addition for nutritional security (El Haddad et al, 2021).

146. Digital and remote-sensing–based innovations are increasingly present in the region, particularly in relation to climate and water information services. Satellite-based drought

monitoring, water accounting tools, and early warning systems for extreme weather are being piloted and scaled by governments and development partners, but knowledge sharing on these digital innovations and what works should be enhanced in the region (FAO, 2022). However, integration of these tools into farm-level advisory services remains limited, and smallholder access to actionable climate information is still uneven.

147. Value-chain and post-harvest innovations exist but are less mature. Technologies aimed at reducing food loss, such as improved storage, cold-chain solutions, and small-scale processing have been piloted in several countries, particularly for horticulture and high-value crops. These interventions show strong potential for climate adaptation and food security but remain constrained by energy costs, infrastructure gaps, and limited private-sector engagement.

148. Overall, while MENA exhibits a growing portfolio of climate-related innovations, most remain technology-focused and fragmented, with limited bundling of climate information, finance, and advisory services at the smallholder level

Europe and Central Asia

149. In ECA, the innovation landscape compared to MENA, shows stronger penetration of digital, data-driven, and precision agriculture innovations, particularly in middle-income countries. Digital agriculture innovations, including weather and pest forecasting platforms, farm-level decision-support tools, and precision irrigation systems are increasingly being deployed in countries such as Turkey, Georgia, and Uzbekistan. These innovations are supported by a combination of public digital agriculture strategies and private-sector engagement, and several have reached early scaling stages. However, access remains uneven, particularly in remote rural areas where connectivity, digital skills, and local service provision are limited (ITU and FAO, 2020).

150. Climate-resilient crop production innovations are relatively advanced, including genomics-driven breeding for heat- and drought-tolerant varieties, conservation agriculture, and improved soil management practices. These are supported by relatively strong research systems and policy frameworks in parts of the region, although adoption among smallholders varies widely by country and sub-region.

151. In Central Asia, climate-relevant innovations in livestock and rangeland systems remain largely nascent. Ongoing pilots in countries such as Mongolia, Kyrgyzstan, and Tajikistan include climate-resilient fodder production, improved pasture and grazing management, small-scale biogas digesters for manure management, and digital traceability tools linked to sustainable livestock value chains (World Bank, 2024). Most of these innovations remain at pilot or early-scale stage and face structural barriers related to extensive production systems, pastoral mobility, and weak rural infrastructure.

152. Emerging innovation areas in ECA also include carbon and ecosystem service–based mechanisms, such as soil carbon sequestration and rangeland restoration pilots in Kazakhstan. By adopting such practices, Kazakhstan has the potential to sequester up to 35 million tons of CO2 per year (Obersteiner et al., 2024). Although still experimental, these initiatives reflect growing interest in linking climate adaptation and mitigation outcomes with new financing models and incentive structures for farmers and pastoralists. Yet, the establishment of robust monitoring and verification systems remains keys in attracting investment and ensuring credibility of the initiatives.

Cross-cutting observations

153. Across both sub-regions, several common patterns emerge. First, innovation efforts are often supply-driven, led by research institutions, governments, or development partners, with limited integration into holistic service delivery models for smallholders. Second, many promising innovations remain at pilot or early scaling stages, with insufficient pathways for sustained adoption. Third, digital technologies are increasingly prominent, but their effectiveness is constrained by gaps in data infrastructure, institutional coordination, and human capacity. These observations highlight the need to assess not only what innovations exist in NEN, but also where the current innovation landscape falls short of the priority needs identified in the next section.

Priority Innovation Areas

154. The scale and urgency of climate risks in the NEN region call for targeted investments in climate adaptation innovations that directly address binding constraints faced by smallholder farmers, pastoralists, and fishers. Across both sub-regions, priority innovation areas emerge around water and land management, climate-resilient production systems, climate risk information, and inclusive service delivery models. These priorities reflect both the dominant climate hazards and the structural characteristics of smallholder agriculture in arid, semi-arid, and rapidly warming environments. Against this backdrop, the following section identifies priority climate innovation areas for NEN that warrant urgent investment and piloting support. These priorities are derived from the region's climate risk profile and livelihood vulnerabilities and provide a framework for assessing the current innovation landscape, identifying gaps, and informing the design of the AFCIA programme.

155. In the MENA region, priority climate innovations focus on strengthening climate-smart agri-food systems under conditions of chronic water scarcity, rising temperatures, and accelerating land degradation (Nisreen et al., 2022). Enhancing climate-sensitive water resource management is central, given that agriculture accounts for approximately 85 per cent of total water consumption and is predominantly rainfed and highly climate-exposed (FAO, 2022). Priority innovations therefore include water-efficient irrigation technologies, deficit and supplemental irrigation practices, and drought-resilient cropping systems tailored to arid and semi-arid conditions.

156. Technologies and practices that strengthen farmers' adaptive capacities, such as climate-resilient crop varieties, improved soil moisture conservation, and integrated crop–livestock systems, are also critical for sustaining productivity and rural livelihoods under increasing climate stress (FAO, 2022). Along agricultural value chains, innovations that reduce post-harvest losses and food waste, particularly through improved storage, processing, and cold-chain solutions adapted to water- and energy-constrained contexts, represent an important adaptation priority with direct food security benefits for countries like Egypt, but also for Morocco and Jordan (Netherlands Enterprise Agency, 2023).

157. Digital innovation is a cross-cutting priority in MENA, given persistent gaps in access to timely climate, weather, and water information. The MENA region, with some of the world's most highly penetrated mobile markets, offers significant potential for digitally enabled, climate-smart agricultural services that integrate satellite imagery, remote sensing, and farm-level advisory systems. These tools can improve drought monitoring, water allocation, seasonal forecasting, and early warning systems for extreme events, thereby strengthening anticipatory action and risk management for smallholders. For instance, Morocco's 2020 "Green Generation 2020–30" strategy prioritizes smart farming,

promoting digital agricultural services and planning over 100,000 solar-powered irrigation pumps (Tricarico, 2021). However, to attract investment and reach scale, an enabling environment is essential: digital agriculture providers and mobile operators need clear commercial pathways, while policymakers must implement supportive regulations and embed rural development at the core of their digital strategies (ibid).

158. Updated NDCs across Europe and Central Asia increasingly prioritize climate adaptation in agriculture, identifying key investment areas such as climate-smart farm-level practices and technologies, disaster risk reduction, climate-resilient infrastructure, agroclimatic and early warning information systems, and strengthened climate risk governance (FAO, 2024). These measures focus primarily on crop systems, followed by forestry, livestock, fisheries, and aquaculture (ibid). Within this context, climate-resilient crop and livestock production systems are a central investment priority especially for Central Asian countries. This includes the development and adoption of stress-tolerant crop varieties, improved pasture and fodder systems, and adaptive livestock management practices (Tajikistan) that reduce heat stress and productivity losses (FAO, 2024). Soil and land management innovations are also critical in the region, given widespread soil degradation, erosion, and declining soil organic matter. Investments in conservation agriculture (Kyrgyzstan), climate-smart soil amendments, and integrated land management approaches are therefore essential to enhance resilience while sustaining yields under changing climatic conditions (FAO, 2024). In parallel, innovations that improve water-use efficiency (Uzbekistan) and climate-proof irrigation infrastructure are increasingly relevant in both rainfed and irrigated systems as precipitation patterns become more erratic (FAO, 2024). Nature-based solutions at territorial/ecosystem level were promoted by all Central Asian countries except for Kazakhstan (ibid).

159. Digital and data-driven innovations also feature prominently as a regional priority. These include climate and weather information services, pest and disease forecasting tools, and farm-level decision-support systems that enable producers to respond proactively to climate risks. However, effective scaling requires complementary investments in rural connectivity, skills development, and local service provision (FAO, 2024). In some parts of ECA, emerging carbon and ecosystem service markets such as soil carbon and rangeland restoration initiatives also represent a promising innovation frontier for incentivizing climate-resilient practices, although these remain at early stages of development (FAO, 2025). While many countries across ECA are considering participating in carbon markets, countries that mention their potential participation in Article 6 often indicate the finalization of trading rules and the implementation of robust MRV systems as prerequisites for their participation (ibid).

Enablers and barriers for climate innovations in smallholder agriculture

160. Across the NEN region, climate innovation in smallholder agriculture is supported by relatively strong research capacity, including national agricultural research systems and long-standing partnerships with international organisations and research centres. In several countries, policy frameworks increasingly recognise climate adaptation, water efficiency, and food system resilience as strategic priorities, creating space for innovation uptake. Investments in climate information systems, early warning mechanisms, and digital agriculture strategies, particularly in parts of ECA and selected MENA countries, provide an enabling foundation for scaling data-driven climate services. Emerging interest in climate finance, ecosystem service payments, and blended finance mechanisms also presents opportunities to incentivise adoption of climate-resilient practices.

161. Despite these enabling factors, systemic barriers continue to limit the scaling and impact. Table 1 below outlines some of these critical barriers to scaling across different

dimensions. Fragmented policy and regulatory frameworks, limited coordination across sectors, particularly water, agriculture, and environment and weak regional cooperation constrain integrated responses to transboundary climate risks. Access to finance remains a major bottleneck, especially for smallholders, pastoralists, and women, due to high upfront costs, limited risk-sharing instruments, and underdeveloped climate insurance markets. Capacity gaps, including limited extension coverage, digital literacy, and local service provision, further hinder adoption of climate innovations, particularly in remote and conflict-affected areas.

162. These enabling conditions and constraints interact differently across MENA and ECA, but together they underscore the importance of integrated, system-oriented approaches to innovation. Addressing financial, institutional, and capacity barriers alongside technological solutions is essential for scaling climate innovations and achieving durable adaptation outcomes in smallholder agriculture.

Table1: Summary of enablers and barriers for mainstreaming climate innovations in NEN

Dimension	Barriers	Enablers
Policy and regulatory environment	• Fragmented or outdated agricultural and water policies limit scaling of climate-smart approaches • Weak regulatory incentives for climate-smart practices • Complex land tenure and communal grazing rights hinder rangeland restoration and community stewardship (especially in Morocco, Tunisia, Jordan)	• Strong regional climate policy processes • Government programs promoting irrigation modernization and salinity management (Egypt, Morocco, Uzbekistan)
Finance and investment	• low access to agricultural credit and insurance for smallholders and pastoralists	• Emerging blended-finance initiatives supporting irrigation modernization, solar pumping, and value chains
Research, knowledge and capacity	• Insufficient extension capacity, especially in dry rangelands and remote mountain systems • Weak integration between research outputs and farmer uptake; technologies often remain in pilot stage • Knowledge gaps on climate risks and localized data (Central Asia and remote pastoral zones)	• Growing digital training programs for farmers in Uzbekistan, Morocco, Jordan • Strong CGIAR and ICARDA presence in NEN facilitating seeds, rangeland, water, and digital innovations
Technology development and access	• High upfront cost of solar irrigation, greenhouse tech, sensors, and drip systems	• Fast expansion of solar energy adoption reduces irrigation costs (Morocco, Jordan, Uzbekistan) • National breeding programs

		increasingly adopting ICARDA's resilient varieties
Socio/cultural and institutional factors	• Pastoral mobility restrictions, border issues, and loss of traditional rotational grazing increase land degradation (Jordan, Syria, Iraq) • Gender-based barriers to extension, finance, and land rights, particularly in rural MENA • Conflict and fragility heavily disrupt innovation systems in Yemen, Syria, Libya, Iraq, Sudan, Somalia	• Strong farmer organizations and cooperatives in Morocco, Tunisia, Georgia, Armenia, and Azerbaijan support uptake of innovation • Youth-led agritech entrepreneurship growth (Egypt, Morocco, Azerbaijan, Uzbekistan)

Indigenous peoples and climate change

163. Indigenous knowledge encompasses the accumulated body of knowledge, practices, beliefs and insights that Indigenous communities have developed and transmitted across generations (Dorji et al., 2023). These knowledge systems are deeply embedded in the cultural, social and ecological settings in which Indigenous peoples live and are inseparable from their relationships with land, the environment and traditional livelihoods (ibid). Across the globe, Indigenous peoples adapt and diversify their livelihood strategies in response to climate variability and change. For instance, the Yabarana people of Venezuela adjust their subsistence activities by shifting between hunting and gathering, fishing, agriculture and animal husbandry in accordance with seasonal and environmental conditions (IFAD, 2016).

Indigenous knowledge in weather forecasting and climate adaptation

164. Indigenous peoples possess centuries, and often millennia, of experience in observing and interpreting local environmental conditions to anticipate weather patterns and manage climate-related risks. Through long-term engagement with their surroundings, Indigenous communities contribute valuable climate histories and baseline information at the local scale. Their knowledge plays a critical role in monitoring environmental change, assessing impacts and implementing locally appropriate adaptation strategies. Indigenous peoples' traditional knowledge provides insights that complement conventional scientific approaches by offering holistic perspectives on ecosystems, natural resources, cultural practices and the interconnections between humans and the environment (IFAD, 2016).

165. The application of Indigenous knowledge to weather forecasting has been essential to the survival of many Indigenous communities and to reducing the adverse effects of climate change. Detailed understandings of plant phenology, animal behaviour and ecological cycles enable Indigenous peoples to associate observable natural events with specific climatic patterns, allowing them to anticipate seasonal changes. This knowledge is often formalised through traditional seasonal calendars, which are based on complex, place-specific environmental indicators and are used to forecast seasons, floods, storms and droughts (Dorji et al., 2023). In Tonga and Tuvalu, for example, traditional forecasting draws on close observations of marine and atmospheric conditions, including wave size and sound, water colour and smell, seaweed accumulation along shorelines, cloud formations, lunar appearances and wind patterns. Similarly, Indigenous communities in the Sahel region of Ghana have developed forecasting systems that demonstrate levels of accuracy comparable to scientific forecasts produced by national meteorological services.

Integrating Indigenous forecasting methods with scientific approaches has enhanced forecast reliability, relevance and community uptake (Dorji et al., 2023).

Indigenous Agricultural Practices for Climate Change Adaptation

166. Research in the agricultural sector highlights the critical role of Indigenous knowledge in promoting climate change adaptation and resilience. Studies identify several key areas in which Indigenous practices enhance climate-resilient agriculture. One such area is the use of climate-smart crop varieties that are adapted to seasonal variability and extreme weather events. For example, Indigenous farmers in Fiji cultivate yam and tapioca varieties capable of withstanding extreme conditions. In Bangladesh, flood-affected Indigenous communities grow saline-tolerant reed species, as well as drought- and salt-tolerant fruit and timber trees, to reduce vulnerability to flooding and sea-level rise while supporting longer-term livelihoods (IFAD, 2016).

167. On-farm conservation is another important adaptive strategy. Crop varieties managed by Indigenous farmers evolve continuously through natural and human selection, resulting in improved adaptive potential. For example, kreb — a mixture of wild and cultivated species, including Digitaria exilis — is traditionally used by pastoralist communities in the Sahel. These communities harvest seeds from open grasslands and actively manage wild species to ensure sustainable seed availability for human consumption and livestock fodder (IFAD, 2016).

168. Indigenous farmers also adjust planting and harvesting calendars based on local environmental cues and employ practices such as crop rotation and intercropping. Intercropping provides multiple benefits: during droughts, it protects topsoil from wind erosion, and during heavy rainfall, it absorbs raindrops, reducing soil erosion. These practices also contribute to income diversification, pest management, soil conservation, and employment generation in local communities (Dorji et al., 2023).

169. Indigenous peoples further enhance traditional farming systems through locally adapted innovations. For instance, farmers in Baojiatun village in China fill rice fields with river water in advance of spring and summer hailstorms to protect crops from damage (Dorji et al., 2023). Traditional post-harvest storage techniques are also widespread. Among Indigenous Himalayan communities in India, cow dung and cow urine are used to protect seeds and stored grain from pests and diseases, thereby reducing post-harvest losses and strengthening food security.

Integrating indigenous knowledge with modern approaches

170. Combining Indigenous knowledge with scientific and modern techniques offers an effective approach to enhance climate change adaptation and strengthen the resilience of Indigenous communities. Innovations that integrate traditional practices with new methods contribute to more robust food production systems, improved food security, sustainable management of fragile ecosystems, and stronger coping mechanisms in the face of climate variability.

171. To be effective and widely adopted, new practices must complement and enhance existing Indigenous systems. This includes leveraging the rich diversity of local plant species, many of which are neglected and underutilized (NUS) despite their significant nutritional and livelihood potential. NUS are particularly valuable because they are naturally adapted to local environmental conditions, resilient to adverse climatic events, and culturally important to Indigenous communities (IFAD, 2016). Integrating these species into farming systems

through innovation not only strengthens Indigenous food systems but also helps conserve traditional knowledge and biodiversity.

172. Supporting the sustainable use of NUS requires policy frameworks at national and international levels and stronger collaboration among institutions working with Indigenous communities. New tools and methods should be co-developed with farmers and value chain actors to enhance their capacity to conserve traditional crops and associated knowledge at the farm level. When effectively combined with Indigenous knowledge, NUS contribute to sustainable and productive agroecosystems, improving resilience to climate change and economic shocks while promoting culturally rooted, healthy, and diversified food systems.

Synthesis and recommendations for AFCIA programme

173. Across IFAD's regions of operation, climate change is a present, compounding threat that reshapes the viability of small-scale agriculture and food security. The evidence reviewed in this study confirms a consistent pattern: while climate adaptation innovations exist in every region, their reach and durability remain constrained by fragmented delivery systems, insufficient climate finance for smallholders, and weak pathways for scaling beyond pilots. In this context, AFCIA has a strategic opportunity to serve as a targeted accelerator for "last-mile climate adaptation innovation", enabling smallholder farmers to access solutions that are not only technically effective but also affordable, inclusive, and scalable under climate related constraints.

Key synthesis findings

174. Adaptation in smallholder agriculture increasingly depends on bundled and systems-based innovation rather than stand-alone technologies. Across regions, the most impactful solutions combine elements such as resilient seeds, soil and water management, climate advisories, risk finance, and market linkages. Whether in Asia's delta systems (salinity and flood risk), East and Southern Africa's mixed crop–livestock landscapes, West and Central Africa's drylands and coastal belts, or the Near East's water-stressed farming systems, isolated technical solutions often fail when not matched with enabling services, governance and finance.

175. The review highlights a persistent "missing middle" innovation gap between early-stage proof of concept and investable scale. Innovations with strong technical promise frequently stall because they lack the operational evidence, institutional embedding, and delivery models required to unlock sovereign finance or large-scale public investment. This creates a bottleneck where adaptation innovations remain dependent on fragmented donor funding and short-term projects, despite strong demand and demonstrated relevance.

176. Climate information is expanding but is still rarely actionable at farm level. Across regions, climate services and early warning systems show increasing coverage, yet their effectiveness is highly dependent on their integration with extension and decision-support systems. Where climate information remains generic, delayed, not localised, or not linked to concrete agronomic or livelihood decisions, its value to smallholders is limited. The need is not simply "more climate data" but better translation into locally usable advisories, delivered through accessible channels and trusted intermediaries.

177. Adaptation finance remains structurally misaligned with smallholder needs, despite growing recognition of the scale of the global adaptation gap. Smallholders face high

upfront costs for resilient technologies and infrastructure (irrigation, storage, cold chains, mechanisation, tree-crop transitions), while financial products often remain inaccessible, unsuitable, or unaffordable. Insurance mechanisms show promise in several regions but remain constrained by weak trust, basis risk, limited bundling with advisory services, and insufficient delivery through farmer organisations. This is particularly acute for women, youth and Indigenous communities due to land tenure gaps and limited collateral.

178. This study confirms that digital innovation is not automatically inclusive. While digitalisation is reshaping advisory services, finance and market access across regions, rural connectivity constraints, low digital literacy, language barriers, and gender disparities frequently reduce uptake. Digital tools are most effective when designed for low-connectivity contexts, supported by training and local interpretation capacity, and combined with offline or hybrid delivery approaches (radio, IVR, extension intermediaries, community-based platforms).

179. Indigenous knowledge systems and locally grounded adaptation practices remain underutilised within formal innovation pipelines. Indigenous Peoples and local communities are often already implementing climate adaptation through diversified cropping, agroecological practices, traditional forecasting systems, soil and water management approaches, and ecosystem stewardship. However, these knowledge systems remain insufficiently integrated into policy design, funding mechanisms, digital advisory tools, and scaling strategies. These risks overlooking some of the most context-fit and socially legitimate solutions for resilience.

Recommendations

180. AFCIA should be designed as a catalytic accelerator that bridges the “missing middle” between promising adaptation innovations and scalable, investable delivery models for smallholders. Rather than financing stand-alone technologies, the programme should prioritize integrated resilience packages that bundle climate information with practical advisory support, affordable risk finance, and locally appropriate production and ecosystem-based solutions. This approach reflects the evidence across regions that innovations only deliver sustained adaptation gains when they are embedded within functioning systems of extension, farmer organisations, service providers, and market incentives. AFCIA’s small-grant mechanism can therefore be used strategically to validate delivery models, generate scaling-ready evidence, and de-risk innovation uptake for governments and partners, enabling successful packages to be absorbed into IFAD loan portfolios and national investment programmes.

181. To ensure innovations reach climate-vulnerable smallholders at scale, AFCIA should concentrate on strengthening last-mile access and usability. This means supporting multi-channel climate services that are actionable in diverse contexts (including low-connectivity and low-literacy settings), investing in aggregation and service intermediaries such as cooperatives, women’s groups and youth-led rural enterprises, and promoting technology ecosystems that include maintenance, repair, and affordable local supply chains. Across regions, these enabling elements are consistently the difference between pilot successes and sustained adoption. AFCIA should also emphasise adaptation innovations that improve livelihoods resilience through stronger post-harvest systems and value-chain participation, recognising that reduced losses, better storage, and climate-resilient market access are essential for converting resilience into stable incomes and food security outcomes.

182. Finally, AFCIA should embed Responsible Innovation by making inclusion and “do no

harm” safeguards central to programme design. Innovation support should deliberately target women, youth and Indigenous Peoples, incorporate Indigenous and local knowledge systems into innovation pathways, and apply clear standards for data governance, land rights protection, and equity outcomes in nature-based and digital solutions. By pairing targeted innovation grants with a robust learning agenda, AFCIA can systematically document what works, for whom, and under what conditions, and can accelerate the replication of proven solutions across IFAD regions through South–South and triangular cooperation, while ensuring that scaling pathways remain socially legitimate, climate-effective, and institutionally sustainable

183. Overall, the analysis confirms that scaling climate adaptation innovation for smallholders requires shifting from fragmented pilots to integrated, financeable, and inclusive delivery systems. AFCIA can provide a critical response to the innovation deficit in smallholder adaptation by supporting bundled resilience pathways, generating scaling-ready evidence, strengthening last-mile service ecosystems, and embedding Responsible Innovation principles. If successfully delivered, AFCIA can help ensure that climate adaptation is not only technically possible, but institutionally adoptable, financially viable, and equitable for the rural communities most exposed to climate risks and with the most urgent needs to quickly adapt to the changing climate.

6. References

ADB. 2017. Agriculture Insurance. 77. ADB Briefs. Manila.

ADB. 2024a. Asia-Pacific Climate Report 2024. Manila

ADB. 2024b. Key Indicators for Asia and the Pacific 2024: Data for Climate Action. Manila

Adechian, S.A., Gouroubera, M.W., Baco, M.N., Ogoudou, C., Yacoubou, A.M. and Abdoulaye, T., 2025. A meta-analysis of factors affecting the adoption of drought-tolerant maize varieties (DTMV) in sub-Saharan Africa. Sustainable Futures, 10, p.101527.

Africa Adaptation Initiative. 2018. Africa State of Adaptation Report. Africa Adaptation Initiative (AAI), New York, USA., 32 pp.

African Risk Capacity (ARC). (n.d.). ARC Replica: Supporting climate risk financing and insurance solutions. https://www.africanriskcapacity.org/what-we-do/arc-replica/

African Union. 2015. Agenda 2063: The Africa we want. African Union Commission. https://au.int/en/agenda2063/overview

AfricaRice. (n.d.). Rice research and innovation (lowlands, stress-tolerant rice, water control systems). https://www.africarice.org/

AGRA. 2021. Yieldwise: Reducing Tanzania's Maize Post-Harvest Losses at Scale.

Applegate, G., Freeman, B., Tular, B., Sitadevi, L. and Jessup, T.C., 2022. Application of agroforestry business models to tropical peatland restoration. Ambio, 51(4), pp.863-874.

Aryal, J.P., Sapkota, T.B., Khurana, R., Khatri-Chhetri, A., Rahut, D.B. and Jat, M.L., 2020. Climate change and agriculture in South Asia: adaptation options in smallholder production systems. Environment, development and sustainability, 22(6), pp.5045-5075.

ASEAN. 2024. Strengthening multi-hazard end to end early warning system for natural disasters. ASEAN Secretariat. Jakarta.

Bennett, A, Dubey, S., Lee, W.T.K., Damen, B. and Bucatariu, C. 2022. FAO Regional Strategy on Food Loss and Waste Reduction in Asia and the Pacific. Bangkok, FAO. https://doi.org/10.4060/cb8959en

Borgomeo, E., Jägerskog, A., Talbi, A., Wijnen, M., Hejazi, M. and Miralles-Wilhelm, F., 2018. The water-energy-food Nexus in the Middle East and North Africa. World Bank: Washington, DC, USA.

Burkhart, S., Underhill, S. and Raneri, J., 2022. Realizing the potential of neglected and underutilized bananas in improving diets for nutrition and health outcomes in the Pacific Islands. Frontiers in sustainable food systems, 6, p.805776

CDB. 2023. Cold Chains and Climate Resilience in the Caribbean. Caribbean Development Bank.

CGIAR CCAFS. (n.d.). Climate services and climate-smart agriculture research (West Africa focus). https://ccafs.cgiar.org/

CGIAR Drylands / CGIAR Research on dryland resilience. (n.d.). Drylands research and integrated resilience approaches. https://www.cgiar.org/

CGIAR. 2023a. Digital Innovation: Digital Tools for Low-Carbon and Climate-Resilient Agriculture in Latin America and the Caribbean. CGIAR Platform for Big Data in Agriculture.

CGIAR. 2023b. Climate-Resilient Crops for Latin America and the Caribbean: Stress-Tolerant Maize, Beans, Coffee and Cacao. CGIAR Research Program.

Challinor, A. J., Watson, J., Lobell, D. B., Howden, S. M., Smith, D. R., & Chhetri, N. (2014). A meta-analysis of crop yield under climate change and adaptation. Nature Climate Change, 4, 287–291. https://www.researchgate.net/profile/Andrew-Challinor/publication/262687950_A_metaanalysis_of_crop_yield_under_climate_change_and_adaptation/links/618d1997d7d1af224bd5c338/A-meta-analysis-of-crop-yield-under-climate-change-and-adaptation.pdf

CIFOR (Center for International Forestry Research). (n.d.). Community forestry, NTFPs, forest landscapes and climate resilience. https://www.cifor.org/

CIFOR–ICRAF. (n.d.). Agroforestry systems for climate adaptation and forest-positive production. https://www.cifor-icraf.org/

CILSS (Permanent Inter-State Committee for Drought Control in the Sahel). (n.d.). Regional Sahel resilience and climate adaptation programming. https://www.cilss.int/

Collins, N., B. van Zanten, I. Onah, L. Marsters, L. Jungman, R. Hunter, N. von Turkovich, J. Anderson, G. Vidad, T. Gartner, B. Jongman. 2025. Growing Resilience: Unlocking the Potential of Nature-Based Solutions for Climate Resilience in Sub-Saharan Africa. © World Bank.

CORAF. (n.d.). Seed systems and stress-tolerant varieties – core reporting and guidance. https://www.coraf.org/publications

CORAF/WECARD. (n.d.). West and Central African agricultural research network (seed systems, CSA). https://www.coraf.org/

CPI. 2023a. Global Landscape of Climate Finance 2023. Climate Policy Initiative.

CPI. 2023b. The Climate Finance Gap for Small-Scale Agrifood systems: A growing challenge. Climate Policy Initiative.

CPI. 2024. Landscape of Climate Finance in Africa 2024. https://www.climatepolicyinitiative.org/publication/landscape-of-climate-finance-in-africa-2024/

CTA (Technical Centre for Agricultural and Rural Cooperation). (2019). The Digitalisation of African Agriculture Report 2018–2019. (CTA archives; report is commonly cited under this title) https://www.cta.int/en/digitalisation-of-african-agriculture

Davis, B., Mane, E., Gurbuzer, L.Y., Caivano, G., Piedrahita, N., Schneider, K., Azhar, N. et al. 2023. Estimating global and country-level employment in agrifood systems. FAO. https://openknowledge.fao.org/handle/20.500.14283/cc4337en

Dorji, Tashi, Kinley Rinchen, Angus Morrison-Saunders, David Blake, Vicki Banham, and Sonam Pelden. "Understanding how Indigenous knowledge contributes to climate change adaptation and resilience: A systematic literature review." Environmental Management 74, no. 6 (2024): 1101-1123.

El Haddad, N., Sanchez-Garcia, M., Visioni, A., Jilal, A., El Amil, R., Sall, A.T., Lagesse, W., Kumar, S. and Bassi, F.M., 2021. Crop wild relatives crosses: Multi-location assessment in durum wheat, barley, and lentil. Agronomy, 11(11), p.2283.

FAO (Food and Agriculture Organization of the United Nations). (n.d.). Farmer Field Schools (FFS) approach and programme materials. https://www.fao.org/farmer-field-schools/en/

FAO. (n.d.). Fall Armyworm programme resources and early warning support. https://www.fao.org/fall-armyworm/en/

FAO. (n.d.). Land tenure and governance resources (including coastal/forest tenure issues).
https://www.fao.org/tenure/en/

FAO. (n.d.). Pastoralism Knowledge Hub (pastoral mobility, rangeland governance, fodder systems). https://www.fao.org/pastoralist-knowledge-hub/en/

FAO. 2020. Leveraging food and agricultural innovation and technology in Asia and the Pacific. Bangkok.

FAO. 2021a. Agroecology in Latin America and the Caribbean: Pathways for Climate Resilience and Sustainable Food Systems. Rome.

FAO. 2021b. The State of Food Security and Nutrition in the World 2021. Food and Agriculture Organization

FAO. 2022a. Agrifood chains in Asia and the Pacific: Benefits and challenges of going digital. Bangkok.

FAO. 2022b. Agroclimatic Services in Latin America and the Caribbean. Rome.

FAO. 2022c. Food Loss, Cold Chains and Climate Change in Latin America and the Caribbean. Rome.

FAO. 2022d. Indigenous Food Systems in Latin America and the Caribbean. Rome.

FAO. 2022e. Low-Emission Livestock Systems in Latin America. Rome.

FAO. 2022f. The State of Land and Water Resources for Food and Agriculture in the Near East and North Africa region. Cairo.

FAO. 2024a. Policy analysis of nationally determined contributions in Europe and Central Asia. Budapest.

FAO. 2024b. Climate change, drought and agriculture in Small Island Developing States – Risks and adaptation options. Rome.

FAO. 2024c. The unjust climate – Measuring the impacts of climate change on rural poor, women and youth. Rome.

FAO. 2025. Carbon markets in Europe and Central Asia – Brief. Budapest.

Fawzi, N.I., Sumawinata, B., Rahmasary, A.N., Qurani, I.Z., Naufaldary, R.G., Nabillah, R., Palunggono, H.B. and Mulyanto, B., 2024. Integrated water management practice in tropical peatland agriculture has low carbon emissions and subsidence rates. Heliyon, 10(5).

Fisher, M., Abate, T., Lunduka, R.W., Asnake, W., Alemayehu, Y. and Madulu, R.B., 2015. Drought tolerant maize for farmer adaptation to drought in sub-Saharan Africa: Determinants of adoption in eastern and southern Africa. Climatic Change, 133(2), pp.283-299.

Flores Rojas, M., Houmy, K., Fawole, O., eds. 2024. Post-harvest management: bridging gaps and embracing innovati ons. Rome, FAO. htt ps://doi.org/10.4060/cd1185en

FSIN & GNAFC. 2025. Global Report on Food Crises. Rome

GIZ. 2021. https://www.giz.de/de/downloads/giz2021-en-digitalizing-the-African-livestock-sector.pdf

GSMA. (2023). The Mobile Economy: Sub-Saharan Africa 2023 https://www.gsma.com/mobileeconomy/sub-saharan-africa/

GSMA. (2023). The Mobile Gender Gap Report 2023. https://www.gsma.com/mobilefordevelopment/resources/the-mobile-gender-gap-report-2023/

GSMA. 2016. The mobile economy. Africa 2016 (Tech. Rep.).

Hassen, Tarek Ben, Hamid El Bilali, Mohammad S. Allahyari, and Chedli Baya Chatti. "Traditional irrigation knowledge for sustainable water resource management in arid Environments: Insights from the MENA region." Journal of Arid Environments 231 (2025): 105466.

HLPE. 2025. Tackling climate change, biodiversity loss and land degradation through the right to food - Background note for the Committee on World food Security's High-Level Forum held of 12 May 2025, in Rome, Italy. Rome, FAO.

Hultgren, A., Carleton, T., Delgado, M., Gergel, D.R., Greenstone, M., Houser, T., Hsiang, S. et al. 2025. Impacts of climate change on global agriculture accounting for adaptation. Nature, 642(8068): 644–652. https://doi.org/10.1038/s41586-025-09085-w (eds.)]. IPCC, Geneva, Switzerland, pp. 1–34. doi: 10.59327/IPCC/AR6-9789291691647.001

IDB Lab. 2023. AgTech Innovation in Latin America and the Caribbean. Washington, DC.

IDB. 2022. Climate Risk Insurance and Blended Finance in Latin America and the Caribbean. Washington, DC.

IFAD (International Fund for Agricultural Development). (n.d.). ASAP+ (Adaptation for Smallholder Agriculture Programme Plus). https://www.ifad.org/en/asap

IFAD. (n.d.). Rural finance policy and smallholder finance resources. https://www.ifad.org/en/rural-finance

IFAD. (n.d.). Targeting policy / inclusion resources (women, youth, vulnerable groups). https://www.ifad.org/en/targeting

IFAD. 2016. The traditional knowledge advantage: indigenous peoples' knowledge in climate change adaptation and mitigation strategies. Rome.

IFAD. 2017. Understanding the adoption and application of conservation agriculture in southern Africa.

IFAD. 2020. Corporate Level Evaluation: IFAD's support to innovations for inclusive and sustainable smallholder agriculture. Rome.

IFAD. 2022a. ASAP Technical Series: Building climate resilience in Asia and the Pacific region.

IFAD. 2022b. Climate Action Report: Climate Advisories and Early Warning Systems in Latin America and the Caribbean. Rome.

IFAD. 2023a. Indigenous Peoples' Forum Report: Traditional Cropping Systems, Water Management and Climate Resilience. Rome.

IFAD. 2023b. Rural Voices: Integrated farming strengthens climate resilience in Cambodia. Rome.

IFAD. 2024. LAC Rural Transformation Report: Digital Markets, Cooperatives and Inclusive Value Chains. Rome.

IFAD. 2025. Pacific Islands Rural and Agriculture Stimulus Facility regional overview.

IFDC (International Fertilizer Development Center). (n.d.). Soil fertility and nutrient management in West Africa. https://ifdc.org/

IITA (International Institute of Tropical Agriculture). (n.d.). Cassava research and climate-resilient value chain development. https://www.iita.org/

ILRI (International Livestock Research Institute). (n.d.). Mixed crop–livestock systems and resilience innovations. https://www.ilri.org/

IPCC. 2021. Climate Change 2021: The Physical Science Basis (AR6 Working Group I). https://www.ipcc.ch/report/ar6/wg1/

IPCC. 2022. AR6 Working Group II: Chapter 9 (Africa). https://www.ipcc.ch/report/ar6/wg2/chapter/chapter-9/

IPCC. 2022. AR6 Working Group II: Small Islands Chapter (for Atlantic SIDS context). https://www.ipcc.ch/report/ar6/wg2/

IPCC. 2022. Climate Change 2022: Impacts, Adaptation and Vulnerability (AR6 Working Group II). https://www.ipcc.ch/report/ar6/wg2/

IPCC. 2023. Summary for Policymakers. In Climate Change 2023: Synthesis Report.

IRENA (International Renewable Energy Agency). (n.d.). Renewable energy in SIDS (solar pumping, desalination, distributed systems). https://www.irena.org/

ISF Advisors. 2025. Beyond the Frontier: Decoding viability in smallholder finance. New York.

ITU & FAO. 2020. Status of Digital Agriculture in 18 Countries of Europe and Central Asia.

IUCN (International Union for Conservation of Nature). (n.d.). Mangrove restoration and coastal ecosystem adaptation resources. https://www.iucn.org/resources/issues-brief/mangroves

Jiri, O., Mafongoya, P. and Musundire, R. (2017), “The use of underutilised crops and animal species in managing climate change risks”, Indigenous Knowledge Systems and Climate Change Management in Africa, Centre for Agricultural and Rural Cooperation (CTA), Wageningen, p. 115.

Kaushik, N., Siddique, K., Ahmed, M.S. and Hakimi, S., 2023. Climate-smart agriculture strategies for South Asia to address the challenges of climate change: Identification of climate-resilient agriculture practices for India, Bangladesh, and Afghanistan. APN Science Bulletin, 13(1), pp.241-262.

Knickel, K. et al. (2009) ‘Towards a Better Conceptual Framework for Innovation Processes in Agriculture and Rural Development: From Linear Models to Systemic Approaches’, The Journal of Agricultural Education and Extension, 15(2), pp. 131–146. doi: 10.1080/13892240902909064.

Krell, N.T., Giroux, S.A., Guido, Z., Hannah, C., Lopus, S.E., Caylor, K.K. and Evans, T.P., 2021. Smallholder farmers' use of mobile phone services in central Kenya. Climate and Development, 13(3), pp.215-227.

Lahham, Nisreen, Javier Mateo-Sagasta, Mohamed OM Orabi, and Youssef Brouziyne. "Context and drivers of water reuse in MENA." Water reuse in the Middle East and North Africa (2022): 3.

Leeuwis, C. 2013. Communication for rural innovation: rethinking agricultural extension. John Wiley & Sons.

Mafongoya, P. and Ajayi, O.C. (2017), Indigenous Knowledge Systems and Climate Change Management in Africa, CTA, Wageningen.

Makate, C., 2020. Local institutions and indigenous knowledge in adoption and scaling of climate-smart agricultural innovations among sub-Saharan smallholder

farmers. International Journal of Climate Change Strategies and Management, 12(2), pp.270-287.

Makate, C., Makate, M., Mango, N. and Siziba, S., 2019. Increasing resilience of smallholder farmers to climate change through multiple adoption of proven climate-smart agriculture innovations. Lessons from Southern Africa. Journal of environmental management, 231, pp.858-868.

Mbilinyi, B., Tumbo, S., Mahoo, H., Senkondo, E. and Hatibu, N. (2005), “Indigenous knowledge as decision support tool in rainwater harvesting”, Physics and Chemistry of the Earth, Parts A/B/C, Vol. 30 Nos 11/16, pp. 792-798.

Messaoudi, F., Ben Nouna, B., Chebil, A., Ounaies, F. and Ben Alaya, A., 2025. Water productivity and economic feasibility of drip irrigation system investment in tomato cultivation: Case of northeastern Tunisia. Irrigation and Drainage, 74(3), pp.1010-1017.

Muhammad, J., Arifudin, A., Budijono, B., Yunus, W.M., Syahril, S., Yusri, Y., Kemal, K., Rany, N. and Suah, E., 2025. Innovative IoT Solutions for Monitoring Water Content in Peat Soil and Their Role in Fire Mitigation in Rimbo Panjang, Kampar, Riau. International Journal of Peatland Research and Innovation, 1(2), pp.64-73.

Muinga, G., Marechera, G., Macharia, I., Mugo, S., Rotich, R., Oniang'o, R., Obunyali, CO.,Oikeh, S. (2019). Adoption of climate-smart DroughtTEGO® varieties in Kenya. African Journal of Food Agriculture Nutrition and Development. 19. 15090-15108. 10.18697/ajfand.87.18355. Diao, X., Cossar, F., Houssou, N., Kolavalli, S., & Jimah, K. (2021). Southern Africa Agriculture Transformation. International Food Policy Research Institute.

Netherlands Enterprise Agency. "Cold chain investment opportunities in horticulture in Egypt." (2023).

Njoroge, S., Mugi-Ngenga, E., Limo, B.M. and Fakoya, O., 2025. Precision Agriculture in Africa: Challenges and Opportunities. Grow. Afr, 4, pp.2-5.

Obersteiner, M., Ivanov, A., Rovenskaya, E., 2024. Carbon Farming in Kazakhstan: Unlocking the Opportunity. Moscow: HSE Publishing House.

OCHA (United Nations Office for the Coordination of Humanitarian Affairs). (n.d.). Sahel situation overview and insecurity context. https://www.unocha.org/

PICS Network (Purdue Improved Crop Storage). (n.d.). Hermetic storage technologies and scaling resources. https://www.picsnetwork.org/

Reij, C., Scoones, I. and Toulmin, C. (2013), Sustaining the Soil: indigenous Soil and Water Conservation in Africa, Routledge

Röling, N. (2009). Pathways for impact: scientists’ different perspectives on agricultural innovation. International Journal of Agricultural Sustainability, 7(2), 83–94. https://doi.org/10.3763/ijas.2009.0043

SERVIR Amazonia. 2022. Geospatial Services for Climate Resilience, Deforestation Monitoring and Land Degradation in the Amazon Basin. SERVIR Global.

Shaw, R., Y. Luo, T.S. Cheong, S. Abdul Halim, S. Chaturvedi, M. Hashizume, G.E. Insarov, Y. Ishikawa, M. Jafari, A. Kitoh, J. Pulhin, C. Singh, K. Vasant, and Z. Zhang, 2022: Asia. In: Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 1457–1579, doi:10.1017/9781009325844.012.

SPC. 2025. Promoting Nature-based Solutions in the Pacific: Key Insights and Recommendations 2025. Pacific Community (SPC), Noumea, New Caledonia.

Swis Re, 2019: Natural Catastrophes: Tracking the protection gap, Swis Re, Online. Available at: http://files.swissre.com/natcat-protection-gap-map/ index.html.

Swiss Re. 2013. Partnering for Food Security in Emerging Markets. Sigma No 1/2013. Zurich, Switzerland.

Tadesse, M.A., Shiferaw, B.A. and Erenstein, O., 2015. Weather index insurance for managing drought risk in smallholder agriculture: lessons and policy implications for sub-Saharan Africa. Agricultural and food Economics, 3(1), p.26.

Tamru, S., Hansen, J., Zebiak, S., Tesfaye, A., Minten, B., Demissie, T., Radeny, M., Tesfaye, K. and Solomon, D., 2025. Climate information services enhance farmers' resilience to climate change: Impacts on agricultural productivity. Climate Risk Management, p.100724.

Tiemann, T. and Douxchamps, S., 2023. Opportunities and challenges for integrated smallholder farming systems to improve soil nutrient management in Southeast Asia. World Development Sustainability, 3, p.100080.

Tricarico, D., 2021. The Opportunity for Smart Farming in the Middle East and North Africa". SMART Magazine.

Trisos, C.H., I.O. Adelekan, E. Totin, A. Ayanlade, J. Efitre, A. Gemeda, K. Kalaba, C. Lennard, C. Masao, Y. Mgaya, G. Ngaruiya, D. Olago, N.P. Simpson, and S. Zakieldeen, 2022: Africa. In: Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 1285–1455, doi:10.1017/9781009325844.011.

UN ESCAP. 2021. Digital technologies for climate change adaptation in Asia and the Pacific.

UNCCD (United Nations Convention to Combat Desertification). (2022). Global Land Outlook (Second Edition). https://www.unccd.int/resources/global-land-outlook/glo2

UNEP (United Nations Environment Programme). (n.d.). SIDS/coastal vulnerability and adaptation resources (saltwater intrusion, coastal risk). https://www.unep.org/explore-topics/oceans-seas/what-we-do/small-island-developing-states

UNEP and FAO. 2022. Sustainable Food Cold Chains: Opportunities, Challenges and the Way Forward. Nairobi, UNEP and Rome, FAO. https://doi.org/10.4060/cc0923en

UNEP. 2025. Adaptation Gap Report 2025.

UNIDO (United Nations Industrial Development Organization). (n.d.). Sustainable cold-chain and energy solutions for agro-processing (fisheries/food systems). https://www.unido.org/

WFP (World Food Programme). (n.d.). Climate Services Toolkit and implementation resources.
https://climateservices.wfp.org/

WFP. (n.d.). R4 Rural Resilience Initiative (insurance + livelihoods + risk reduction bundles).
https://www.wfp.org/r4-rural-resilience-initiative

WMO (World Meteorological Organization). (2021). State of the Climate in Africa 2021. https://public.wmo.int/en/our-mandate/climate/wmo-statement-state-of-global-climate

WMO (World Meteorological Organization). 2023. State of the Climate in Latin America and the Caribbean. Geneva.

World Agroforestry (ICRAF). (2014). Technical Brief: Farmer Managed Natural Regeneration (FMNR). https://www.worldagroforestry.org/sites/default/files/Annex%203.2%20Technical%20Brief%20Farmer%20Managed%20Natural%20Regeneration.pdf

World Bank & FAO. (2021). A Blueprint for Strengthening Food System Resilience in West Africa: Regional Priority Intervention Areas. Washington, DC. https://documents1.worldbank.org/curated/en/159271620852988135/pdf/A-Blueprint-for-Strengthening-Food-System-Resilience-in-West-Africa-Regional-Priority-Intervention-Areas.pdf

World Bank. (n.d.). West Africa Coastal Areas (WACA) Management Program. https://www.worldbank.org/en/programs/west-africa-coastal-areas-management-program

World Bank. 2020. The Next Generation Africa Climate Business Plan : Ramping Up Development-Centered Climate Action. World Bank, Washington, DC. Available at: https://openknowledge.worldbank.org/handle/10986/34098

World Bank. 2021. Disaster Risk Financing in Latin America and the Caribbean. Washington, DC.

World Bank. 2024. In-Depth Assessment of Climate-Smart Livestock in Tajikistan. Washington, DC.

WRI, 2025 https://www.wri.org/insights/nature-based-climate-solutions-sub-saharan-africa

Annex 2 Stakeholder Engagement Plan

Purpose:

To ensure that the full proposal is co-created with key stakeholders, informed by practical experience, and aligned with both IFAD country needs and national priorities.

Objectives:

- Validate key findings from the background study
- Identify regional and thematic priorities for innovation
- Co-design the operational model of the Adaptation Innovation Centre (grant mechanism, knowledge platform, scaling pathway)
- Identify relevant partners, draw synergies and ensure ownership of the AFICA programme across IFAD divisions, member countries, and external stakeholders.

Outputs of consultation process:

- Validated list of priority innovation areas per region
- Stakeholder partnership matrix and engagement plan
- Operational design parameters for the Innovation Grant Facility

	Phase and timeline	Objective	Format	Stakeholders	Deliverable
Project Design (Phases 1-3)	1. Project Inception and background study intra- and inter -divisional consultations	- Build a shared understand of the project objectives with the PDT. - Agree on consultation approach with PDT - Gather regional insight for the finalisation of the background study - Agree on the process and mechanism for the on-granting	- Internal briefings with PDT - Bilateral discussions with regional team focal points - Targeted consultations with technical leads on project targeting, gender approach, innovation priorities (ECG, PMI)	- PDT - Regional Specialists - ECG Thematic experts and regional climate specialists	- Agreed consultation roadmap - Mapping of innovation priorities in area of climate adaptation - Stakeholder partnership matrix completed
	2. Regional consultations with a few priority countries per region	- Validate outputs of the background study and innovation priorities - Gather intelligence for regional/country landscape and potential partners	- Internal regional consultations with priority countries	- Regional specialists/focal points - IFAD Country representatives - ECG/PMI Thematic experts and regional climate specialists	- Regional innovation priorities validated - Project components, sub-components and activities agreed - Scaling approach agreed - Key regional/country partners identified for external consultations
	3. External consultations for technical and policy alignment and co-design of	- Align project proposal with work of other partners and identify synergies	- Regional roundtables with stakeholders - Thematic working group discussions	- PDT - Farmers organisations - Indigenous Peoples representatives	- Regional partners confirmed and mechanisms for coordination and

	Innovation grant Window	- Co-design of technical parameters of innovation grant mechanism	(digital innovations, NbS, integration of indigenous knowledge, financial innovations, youth inclusion etc)	- Regional research institutions Development partners - Regional Rural Youth Associations - Regional network representatives	partnership defined and agreed - Awareness raised on project and forthcoming call for innovation proposals - Finalised full proposal
Project Implementation (Phases 4-6)	4. Launch of ASAP+ Innovation Centre and first call for proposals	- Maintain momentum following project approval and use network of partners to launch call for proposals	- 3 Regional sessions to launch innovation centre and call for proposals	- IFAD regional offices and country teams - External development partners and civil society organisations - Private sector networks	- Awareness raised of project and wide sharing of call for proposals attracting diverse applications
	5. Partnership consolidation and continuous feedback and learning	- Promote knowledge exchange and establish feedback mechanisms	- Annual regional dialogues - Mid-term workshop - Cross-country learning through SSTC	- IFAD regional teams - Project grantees - Regional policy networks - Ministries from countries hosting selected sub-projects - Civil society organisations - Development partners - Representatives from IFAD projects	- Learning network established - Mid-term lessons captured - Scaling pathway for piloted innovations established through linkages with IFAD PoLG

	6. Knowledge sharing and policy engagement	- Dissemination of project results and scaling of successful innovations through IFAD PoLG and cross-country learning	- Publication of case studies and policy briefs - SSTC exchanges	- Relevant ministry representatives - Development partners - Relevant representatives from IFAD projects - Project grantees	- Sustained visibility and policy engagement - Documented success storied and policy briefs

Table 1. Programme Consultation Plan

Stakeholders Consulted During IFAD Regional Consultations

- Ahmad, Saib - Temporary Professional Officer (Climate), ECG
- Anavitarte, Daniel - Country Director, LAC
- Arcese, Rachele - Country Director ad interim, APR
- Borzelli Gonzalez, Margarita - Regional Specialist, LAC
- Brou, Yao Bernard - Envir.&Climate Officer (SECAP), ECG
- Brudersohn, Sebastian - Regional Specialist, NEN
- Cencelli, Irene - Temporary Professional Officer (Climate Programme Officer), ECG
- Codjo, Steve - Partnership Analyst, DCO (SSTC Unit)
- Cooke, Roshan - Country Director, APR
- Cortadellas Mancini, Marc - Junior Professional Officer, WCA
- Davidson, Ashley Anne - Regional Specialist, WCA
- Elbaroudi, Ilyasse - Sr. Technical Spec. (SECAP), ECG
- Firmian, Ilaria Carlotta - Senior Technical Specialist Indigenous Peoples, ECG
- Garbero, Alessandra - Lead Regional Economist, NEN
- Gebremedhin, Addisu - Consultant, ESA
- Hennings, Enrique - MesoAmerica and the Caribbean Hub Head, LAC
- Iweins, Mathilde - Senior Global Technical Specialist, Natural Resource Management, PMI
- Jijyan, Vrej - Head MCO/Country Director, NEN (MCO Cairo)
- Khanal, Kyalima - Freelance, APR (Consultants)
- Kone, Yassine - Freelance, WCA (Consultants)
- Kouakou, Sara Aya - Lead Portfolio Advisor, ESA
- Loddoni, Margherita - Environment, Climate, Gender and Social Inclusion Division
- Longo, Roberto - Country Director, NEN (MCO Istanbul)
- Lugaresi, Luigi - Interns Regular, ECG
- Maazou, Oumarou - Country Director, WCA
- Martin, Gilles - Senior Technical Specialist Climate Change, ECG
- Mensah, Isaac - Programme Officer, WCA
- Messan, Fumilayo Hermann - Country Director, WCA
- Michiels, Wietse - Adaptation Fund Technical Specialist, ECG
- Miro Quesada, Liliana - Regional Specialist, APR
- Moinier, Clemence - Freelance, ECG (Consultants)
- Moola, Lakshmi - Country Director, WCA
- Mottet, Anne - Lead Global Technical Specialist - Livestock, PMI
- Nasr, Walid - Lead Regional Environment and Climate Specialist, ECG
- Ntukanyagwe, Aimable - Adaptation Fund Technical Specialist, ECG
- Nyathi, Mmeli - Freelance, ESA (Consultants)
- Olinga Biwole, Joseph Rostand - Country Director, ESA
- Omar, Rasha - Country Director, NEN
- Page, Oliver - Lead Regional Climate Change and Environmental Specialist, ECG
- Peglidou, Paraskevi - Temporary Professional Officer, ECG
- Perusini, Flavia - Climate and Environment Specialist, ECG
- Pita Vidal, Karla Sofia - Temporary Professional Officer, ECG
- Popusoi, Doina - TPO - Agroecology (GP-SAEP), PMI
- Pouakone Sechoutdi, Yaya - Country Operations Analyst, WCA
- Rahaga, Ndriana - Country Programme Analyst, ESA
- Ramaroson, Nivohary - Country Programme Analyst, ESA
- Reddy, Sankari - Temporary Professional Officer, ECG
- Reiner, Claus - Lead Reg.Tech.Spec.(Env&Clim), ECG
- Rossiter, Jack - Senior Technical Specialist (ASAP Manager Environment &Climate), ECG
- Salkim, Emre - UNV, NEN (MCO Istanbul)
- Singh, Esha - Regional Technical Specialist - ICT4D in Agriculture, PMI
- Stordeur, Isabelle - Logframe Analyst, NE
- Tchoundi Kamnang, Guillaine Audrey - Temporary Professional Officer - Fisheries and Aquaculture, PM
- Teixeira, Alexandra - Country Programme Analyst, LAC
- Turinayo, Ann - Country Director, WCA
- Vieira, Hardi Michael Wulf - Country Programme Coordinator, LA

	Partner/Institution Name	Country/Region
Eleanor Dictaan-Bang-oa	Tebtebba Foundation	Philippines
Jane Lingbawan	Tebtebba Foundation	Philippines
Jacqueline Macharia	Samburu Women Trust (SWT)	Kenya
Alice Mwangi	Samburu Women Trust (SWT)	Kenya
Margarita Antonio	Foro International Mujeres Indígenas (FIMI)	Peru
Hastblade Largo Ramírez	Foro International Mujeres Indígenas (FIMI)	Peru
Yohanis Amador Lidueña	Foro International Mujeres Indígenas (FIMI)	Peru
	001 Digital Network of Mentors	Kenya
	AgrofixiNG	Nigeria
	Agrolinking	Nigeria
	Ajdkk	Sénégal
	Ambuvets Konsult	Nigeria
	AQUASMART Philippines	Philippines
	Araya Community and Environmental Healthcare Initiative	Nigeria
	Asociacion bosque de ls nuwas	Peru
	Asociacion De Servidores Turisticos "Virgen De Guadalupe" San Jacinto / Capítulos Nacionales De Juventud Wwf Ecuador	Ecuador
	Asociando Jóvenes Emprendedores (ASOJE)	Colombia y Panamá

Association des jeunes pour le développement de DEBI	Sénégal
Association Pour l'Environnement et le Développement en Afrique (APEDEA)	Sénégal
BAXINT - Cell-Free Biofungicide for Agriculture	Argentina
Cambodia Indigenous Women Association (CIWA)	Cambodia
Cambodia Indigenous Youth Association (CIYA)	Cambodia
Capítulo Nacional de la Juventud de Colombia del Foro Mundial de la Alimentación	Colombia
Capítulo Nacional de la Juventud de Colombia del Foro Mundial de la Alimentación	Colombia
Cadre de Concertation des Producteurs d'Arachide (CCPA)	Sénégal
Chambre de commerce d'industrie et d'agriculture de kaffrine	N/A
Conseil National de Concertation et de Coopération des Ruraux (CNCR)	Sénégal
Conseil National de Concertation et de Coopération des Ruraux (CNCR) / CNCFTI	Sénégal
Comuna Morales Chupa Cushcagua - SAPI	Ecuador
Coopérative amagar	Maroc
COOPROBAOLUPE	República Dominicana
Dairei Banana Food Processing	India
Debisi farm	Nigeria
Desert Fish	Algeria
Eco Science Generation Initiative	Nigeria
EcoBridge Climate Initiative	Nigeria
Ekiti state for the deaf association	Nigeria

Family Green Corporation	CAMEROUN
Food And Agriculture research and Extension Institute (FAREI)	Mauritius
Farmers Livelihood Improvement Association	Cambodia
FMD AGRO CONCEPT	Nigeria
FPA	Sénégal
International Association of Students in Agriculture and Related Sciences (IAAS)	Nepal
Jóvenes & Ecosistemas Latinoamerica / Capítulo Nacional Ecuador del WFF	Ecuador
Karibaribi kilimo biashara self-help group	Kenya
Korogocho Response Safety Team	Kenya
Lak Nature International Pvt Ltd	Sri Lanka
Mondelez	Côte d'Ivoire
Nodo mocoa red jóvenes rurales	Colombia
Ogun State	Sénégal
Plateforme Nationale Des Clubs Changement Climatique Du Sénégal PN3C	Sénégal
PWD	Nigeria
Red Mundial De Jovenes Profesionales Por El Desarrollo Agrario Capitulo Colombia	Colombia
Red nacional jovenes rurales nodo mocoa	Colombia
Société Ivoirienne de Gestion et de Recyclage des Déchets (SIGERD)	Côte d'Ivoire
Smalholder Africa	Kenya
The WFF National Youth Chapter Ecuador	Ecuador

Ujak	Sénégal
UNCES CNCR	Sénégal
University of Ghana	Ghana
Visionary Students initiative	Zambia
World Food Forum Mauritius	Mauritius
Youth Food Lab	Nepal
Réseau des organisations paysannes et de producteurs agricoles de l'Afrique de l'Ouest	West Africa
Plateforme Régionale des Organisations Paysannes d'Afrique Centrale	Central Africa
Association for the Promotion of Livestock in the Sahel and Savannah	
Réseau Billital Maroobe	
Indigenous Partnership for Agrobiodiversity and Food Sovereignty	
La Via Campesina	
OMA	
WFF	

Table 2. List of external partners engaged in AFCIA consultations

Summary of Consultation Outcomes

The regional consultations held across West and Central Africa (WCA), the Near East, North Africa, Europe and Central Asia (NEN), East and Southern Africa (ESA), Latin America and the Caribbean (LAC), and Asia and the Pacific (APR) confirmed strong demand for an agile, risk-tolerant climate innovation facility. Stakeholders highlighted the need for a micro-grant mechanism to bridge the gap between early-stage innovation and scaling through IFAD operations.

Across regions, consultations identified priority thematic areas for innovation, including agroecology and circular bio-inputs, digital agriculture and artificial intelligence, water management in dryland systems, and inclusive climate finance and insurance solutions. Regional specificities were also emphasized. In LAC, strong interest was expressed in innovations led by Indigenous Peoples, building on ongoing initiatives under IPAF. In NEN, climate insurance and risk financing mechanisms were identified as key priorities. In ESA, stakeholders highlighted existing South–South and Triangular Cooperation initiatives, particularly in the livestock sector, as important entry points for cross-regional learning.

Consultations also underscored the need to build on and complement ongoing innovation initiatives across regions, ensuring synergies and avoiding duplication with existing IFAD-supported programmes and external facilities. Close coordination with regional divisions and country teams was identified as essential throughout implementation to align innovation sourcing with country priorities and operational pipelines.

To ensure relevance, viability and scalability, proposed innovations will be required to demonstrate a clear value proposition, alignment with regional strategies and national adaptation priorities, and potential for integration into IFAD's Programme of Loans and Grants. This approach ensures that supported innovations are demand-driven, context-specific, and positioned for scaling beyond the pilot stage.

Extensive consultations were also conducted with a broad range of stakeholders outside of IFAD to ensure that the design of the AFCIA programme reflects realities on the ground, builds on existing innovation ecosystems, and responds to the priorities of rural communities. These engagements were carried out through IFAD's established rural civil society and partner engagement mechanisms, including consultations with IFAD's Grassroots Rural Youth Alliances, the West and Central Africa (WCA) Farmers' Forum Steering Committee, and partners of IFAD's Indigenous Peoples' Assistance Facility (IPAF). Additional exchanges and consultations will also be held with research institutions, development partners, and ecosystem actors engaged in climate adaptation, entrepreneurship, and rural innovation during the implementation of the programme.

So far, the consultations have provided critical insights on barriers faced by local innovators and rural organizations. Participants consistently highlighted limited access to early-stage financing, weak linkages between grassroots innovation and formal investment pipelines, and the need for flexible support mechanisms that allow testing, iteration, and learning. A key concern raised across both Indigenous Peoples' organizations and farmers' organizations was the persistent difficulty rural actors face in accessing climate finance, despite being at the forefront of climate impacts and adaptation efforts. Stakeholders emphasized that existing financing mechanisms are often inaccessible due to complex procedures, scale requirements, and limited institutional capacity, underscoring the importance of simplified, inclusive funding windows that can directly reach local innovators and community-based organizations. Participants also stressed the importance of locally led innovation, strengthened partnerships between communities and technical actors, and clear pathways to scale successful solutions through existing IFAD programmes and national systems.

Crucially, the design process intentionally prioritized the voices of young people. Direct engagement with rural youth networks enabled the programme to capture their needs, ideas,

and priorities related to climate adaptation, livelihoods, and innovation opportunities. Their contributions will inform the calls for proposals, including the focus on small catalytic grants, capacity support alongside financing, and accessible application modalities. As a result, the AFCIA proposal is demand-driven, context-responsive, and grounded in rural youth ownership and participation from the outset.

Annex 3: Environmental and Social Risk Assessment

1. Environmental and Social Risk Screening and Categorisation

The programme has been screened for its potential environmental and social impacts against the Adaptation Fund's fifteen Environmental and Social Principles and has been classified as Medium Risk (Category B). IFAD's Environmental and Social Screening checklist has been mapped against the corresponding AF Principles to ensure consistency and compliance with both. Given the global scope of AFCIA and the context-specific nature of climate risk, it is not feasible to conduct detailed climate risk assessments at the programme design stage. Instead, climate risk assessments will be undertaken at the sub-project level by selected grantees as part of the Environmental and Social Management System (ESMS) following the shortlisting phase of the selection process. Each innovation proposal, based on its specific intervention and implementation context, will be assessed for its own climate-related risks.

Notwithstanding the above, considering the size, scope, and thematic focus of the innovations to be funded, it is anticipated that potential environmental and social risks will be low to moderate in nature and can be effectively managed through appropriate mitigation measures. As the identification and sourcing of climate adaptation innovations is a core element of the programme, only limited information is available at this stage to assess sub-project-specific risks. Accordingly, environmental and social risk screening is conducted at the programme level, reflecting IFAD's institutional safeguards, systems, and oversight arrangements.

During the sourcing and selection process, each shortlisted innovation grant will be required to conduct a detailed environmental and social risk assessment and develop corresponding mitigation measures in accordance with the Adaptation Fund's Environmental and Social Policy and IFAD's SECAP. Risk categorization and safeguard instruments will be reviewed and cleared by IFAD prior to final grant approval and signature of grant agreements. In line with programme eligibility criteria, no Category A investments will be financed.

The programme-level Environmental and Social Management Plan (ESMP) will provide the framework for tracking identified risks and any emerging risks throughout implementation, ensuring that they are systematically monitored, reported, and addressed. The programme will fully comply with applicable national laws and regulations, the Adaptation Fund's Environmental and Social Policy, and IFAD's Social, Environmental and Climate Assessment Procedures.

2. Alignment between AF ESP and IFAD SECAP

IFAD's Social, Environmental and Climate Procedures (SECAP) were approved in 2025 and updated in 2017 and 2021. They comprise 9 Social, Environmental and Climate Standards, setting out mandatory requirements that must be integrated throughout the project cycle. All IFAD projects entering the pipeline are subject to an environmental, social and climate risk screening, and are assigned a risk category for environment and social risks (High, Substantial, Moderate or Low), and for climate risks (High, Substantial, Moderate or Low). Projects with "Low environment and social Risk" and "Low" climate risk do not require any further analysis. Moderate Risk projects require: (i) the final SECAP review note and ESCMP, indicating how potential risks and impacts can be avoided or mitigated; and (ii) an environmental and social monitoring programme. Projects classified Moderate Risk for climate require a basic climate analysis. For projects with High and Substantial environmental and social risks and impacts, the due diligence process entails a critical review of the documentation provided by the borrower/recipient/partner. The table below presents how AF ESP Principles link to IFAD SECAP[12].

[12] Further details can be found here: https://www.ifad.org/en/social-environment-assessment-procedures

AF ESP Principle	IFAD SECAP Standard, Guiding Principles and Values
Compliance with the Law	SECAP requires that activities in the framework of the IFAD financed projects or programmes meet IFAD's safeguard policy guidance, comply with applicable national laws and regulations (labour, health, safety, etc.) and international laws and treaties, and the prohibited investment activities list produced by the International Finance Corporation is adhered to.
Access and Equity	Access and Equity is a cross-cutting issue in all the 9 SECAP standards. SECAP requires that projects and programmes ensure the participation of target groups and equitable distribution of benefits. When projects result in physical or economic displacement (affecting access and user rights to land and other resources), the borrower or grant recipient should obtain FPIC from the affected people, document stakeholder engagement and consultation process and prepare resettlement plans or frameworks. **Standard 2 – Resource efficiency and pollution prevention** highlights that Sustainable management requires that people who are dependent on these resources are properly consulted, enabled to participate in development and share equitably in the benefits of that development, and indicates that IFAD promotes an integrated water resources management approach that seeks the coordinated development and management of water, land and related resources in order to maximize economic and social welfare in an equitable manner and without compromising the sustainability of ecosystems. **Standard 3 – Cultural Heritage** includes the following objective: promote the equitable sharing of benefits from the use of Cultural Heritage. **Standard 4 – Indigenous People** includes the following objective: ensure indigenous peoples obtain fair and equitable benefits and opportunities from supported activities in a culturally appropriate and inclusive manner.
Marginalized and Vulnerable Groups	Marginalized and Vulnerable Groups is a cross-cutting issue in all the 9 SECAP standards, as such groups are also the primary target of IFAD interventions.
Human Rights	Human Rights is a cross-cutting issue in all the 9 SECAP standards. Among the Guiding Principles and Specific Requirements for IFAD's SECAP, is the principle to "support the efforts of borrowers/recipients/ partners to respect human rights, avoiding infringement on any human rights and addressing adverse human rights risks and impacts caused by clients' business activities".
Gender Equity and Women's Empowerment	Gender Equality and Women's Empowerment is a cross-cutting issue in all the 9 SECAP Standards.
Core Labour Rights	Core Labour Rights is a cross-cutting issue in all the 9 Standards. One of the guiding values and principles for SECAP is to minimize adverse social impacts and incorporate externalities. Avoid and mitigate any potential adverse

impacts on health and safety, labour and working conditions and well-being of workers and local communities.

The requirements set out in **Standard 5 – Labour and working conditions** are designed to achieve the following objectives:

(i) Promote direct action to foster decent rural employment;

(ii) Promote, respect and realize fundamental principles and rights at work through preventing discrimination and promoting equal opportunity of workers; supporting freedom of association and the effective recognition of the right to collective bargaining; and preventing the use of child

labour and forced labour;

(iii) Protect and promote the safety and health of workers;

(iv) Ensure projects comply with national employment and labour laws and international commitments; and

(v) Leave no one behind by protecting and supporting workers in disadvantaged and vulnerable situations, including a special focus, as appropriate, on women workers, young workers, migrant workers, workers in the informal economy and workers with disabilities

Indigenous Peoples

Standard 4 – Indigenous People is a cornerstone to IFAD's goal to design projects not only with the full, effective and meaningful participation of indigenous peoples but also in a manner that aligns with their distinct vision and development priorities, building sustainable partnerships with indigenous peoples. Standard 4 seeks to ensure that projects are designed and implemented in a way that fosters full respect for indigenous peoples and their human rights, livelihoods and cultural uniqueness as they define them. The need for the standard is an acknowledgement of a history of discrimination and exclusion of indigenous peoples that has limited or prevented them

from directing the course of their own development and well-being.

The requirements set out in Standard 4 are designed to achieve the following objectives:

(vi) Promote indigenous peoples ability to determine and develop priorities and strategies for exercising their right to development;

(vii) Ensure that programming is designed in partnership with indigenous peoples, with their full effective and meaningful consultation and participation, with the objective of seeking their free, prior and informed consent (FPIC);

(viii) Ensure indigenous peoples obtain fair and equitable benefits and opportunities from supported activities in a culturally appropriate and inclusive manner; and

	(ix) Recognize and respect the rights of indigenous peoples to their lands, territories, waters and coastal seas and other resources that they have traditionally owned or otherwise occupied and used.
Involuntary Resettlement	**Standard 7 – Physical and economic resettlement** recognizes that increasing investments in the rural sector may at times involve project-related land acquisition and restrictions on land use actions that, if improperly managed, may have adverse impacts on communities and persons, including physical displacement (relocation, loss of residential land or loss of shelter), economic displacement (loss of land, assets or access to assets, leading to loss of income sources or other means of livelihood) or both. The term "involuntary resettlement" refers to these impacts. Resettlement is considered involuntary when affected persons or communities do not have the right to refuse land acquisition or restrictions on land use that result in displacement.
Protection of Natural Habitats	**Standard 1 – Biodiversity conservation** requires identification of habitat type and applies increasingly stringent requirements based on an areas' biodiversity values. Where natural habitats are affected, IFAD-funded/supported projects and programmes will proceed only after putting in place appropriate mitigation measures to achieve no net loss, and preferably a net gain of the associated biodiversity values over the long term. This must be accompanied by a robust long-term biodiversity action plan or equivalent that describes conservation outcomes and implementation, monitoring and evaluation actions.
Conservation of Biological Diversity	The requirements set out in **Standard 1 – Biodiversity conservation** are designed to achieve the following objectives: (i) maintain and conserve biodiversity; (ii) preserve the integrity of ecosystems; (iii) maintain and enhance the benefits of ecosystem services; (iv) adopt the use of a precautionary approach to biodiversity conservation and ensure opportunities for environmentally sustainable development; (v) ensure the fair and equitable sharing of the benefits from the utilization of genetic resources; and (vi) respect, preserve, and maintain knowledge, innovations and practices of indigenous peoples, and local communities relevant to the conservation and sustainable use of biodiversity and their customary use of biological resources.
Climate Change	SECAP asks to incorporate climate change risk analysis into projects, which are subject to an environmental, social and climate risk screening, and are assigned a risk category for climate vulnerability (substantial, high, moderate, low). The requirements set out in **Standard 9 – Climate change** are designed to achieve the following objectives: (i) ensure alignment of IFAD-supported projects with targets and priorities of countries' Nationally Determined Contributions and the goals of the Paris Agreement and other international frameworks; (ii) ensure that proposed activities are screened and assessed for climate change and disaster risks and impacts both of and to projects; (iii)

	apply the SECAP risk mitigation hierarchy principle of applying a hierarchy of risk management measures in project design; (iv) strengthen the climate resilience of communities and their adaptive capacity to address risks of climate change impacts and climate-related disasters; and (v) increase the ability of communities to adapt to the adverse impacts of climate change, and foster climate resilience and low GHG- emitting projects that do not threaten without compromising food production.
Pollution Prevention and Resource Efficiency	**Standard 2 – Resource efficiency and pollution prevention** includes requirements that aim at ensuring that IFAD-supported projects and programmes minimize, mitigate and manage any risks and potential adverse impacts that may be related to resource use and pollution, with the following objectives: (i) avoid, minimize and manage the risks and impacts associated with hazardous substances and materials, including pesticides; (ii) avoid or minimize project-related emissions of short-and long-lived climate-change related pollutants; (iii) promote sustainable use of resources, including energy, land and water; and (iv) identify, where feasible, project-related opportunities for resource-use efficiency.
Public Health	The requirements of **Standard 6 – Community Health and Safety** aim to ensure that IFAD supported programs and projects avoid or minimize the risks and impacts to community health, safety and security.
Physical and Cultural Heritage	The requirements set out in **Standard 3 – Cultural heritage** are designed to achieve the following objectives: (i) preserve and safeguard Cultural Heritage; (ii) ensure that effective and active measures are taken to prevent IFAD-supported projects from altering, damaging, or removing any tangible or intangible Cultural Heritage; (iii) promote the equitable sharing of benefits from the use of Cultural Heritage; (iv) promote meaningful consultation on matters relating to Cultural Heritage.
Lands and Soil Conservation	**Standard 2 – Resource efficiency and pollution prevention** includes a specific focus on soil conservation, stating that sustainable soil management is an essential element of sustainable agriculture and is central to sustainable intensification, climate -change resilience and safeguarding ecosystem services and biodiversity.

Table 1 - Alignment of AF ESP principles to IFAD SECAP framework

3. Programme level Environmental and Social Management Plan (ESMP)

The screening above provided the foundation for mitigation measures outlined below. An Environmental and Social Management Plan (ESMP) was developed based on the outcomes of the screening, aimed at pre-empting and mitigating potential adverse impacts throughout project implementation.

The ESMP is a living document that will be regularly reviewed and refined during project implementation to ensure alignment with the Adaptation Fund's Environmental and Social

Policy and the consistency of mitigation strategies. This approach extends to the activity level, with continuous screening of project activities against the Adaptation Fund's Environmental and Social Policy standards prior to implementation.

Table 2. Programme level Environmental and Social Management Plan

AF ESP Principle	Risk Identified	Possible Impact	Level of Risk	Mitigation Measure	Responsible	Monitoring arrangements/indicators
Access and Equity	Innovations may not be accessible to the most vulnerable groups due to social, economic, digital, or institutional barriers.	Unequal distribution of benefits; exclusion of smallholder farmers, women, youth, or marginalized communities from innovation uptake.	Low	• Clear eligibility and evaluation criteria prioritizing IFAD target groups (smallholders, women, youth, vulnerable groups). • Minimum 50% of sub-projects required to respond to women's differentiated needs. • 50% of innovation funding channelled through IFAD's Indigenous Peoples Assistance Facility (IPAF). • Inclusive consultations with beneficiaries during sub-project implementation. • Component 2 activities to strengthen information and communication gaps amongst target users	IFAD AFCIA PDT, Safeguards Specialist, Grantees	•Participation rates of women, youth, and marginalized groups in consultations and learning platforms. •Number of trainings delivered to target users on different thematics to increase their capacities to uptake innovations

Gender Equity and Women's Empowerment	Risk of low participation of women in piloting, demonstration, and adoption of innovations; risk of reinforcing existing gender norms.	Reduced benefits for women; missed opportunities to strengthen women's resilience and agency.	Low	• Alignment with IFAD Gender Policy, Gender Action Plan, and AF Gender Policy. • Minimum 50% threshold for gender-responsive innovation proposals; encouragement of women-led enterprises. • Mandatory gender and targeting assessment at preselection stage. • Evidence of demand and uptake by women required for more mature innovations. • Co-creation pathways and farmer feedback loops with specific attention to women's participation. • Multi-stakeholder innovation platforms facilitated by IFAD to support participatory design. • Gender-disaggregated monitoring and reporting at sub-project and programme levels.	IFAD M&E specialist and Grantees	• % of innovation grants meeting gender criteria. • Women's participation rates in pilots, demonstrations, and learning platforms. • Availability of gender-disaggregated data in M&E reports. • Implementation of Gender Action Plan measures.
Indigenous Peoples	Risk of inadequate consultation or benefits not aligned with Indigenous Peoples' priorities.	Erosion of Indigenous Peoples' rights, exclusion from benefits, or lack of ownership of innovations.	Low	• Allocation of 50% of innovation funding through IPAF to Indigenous Peoples-led or Indigenous-focused innovations. • IPAF eligibility criteria requiring grantees to be Indigenous organizations or designated entities acting on their behalf. • Mandatory evidence of Free, Prior and Informed Consent (FPIC). • Culturally appropriate and meaningful participation throughout project design and	IPAF Secretariat, Grantees	• FPIC documentation available for all relevant sub-projects. • Number of IPAF-supported innovation grants. • Evidence of Indigenous participation in design, implementation, and monitoring.

				implementation. • Recognition and integration of Indigenous knowledge systems.		
Conservation of Biological Diversity	Innovations may inadvertently affect ecosystems, biodiversity, or ecosystem services if not properly screened.	Localized environmental degradation; loss of biodiversity or ecosystem services.	Low	• Compliance with AF ESP and IFAD SECAP biodiversity standards. • Environmental screening and assessment conducted prior to sub-project approval. • Integration of mitigation measures into sub-project ESMPs where risks are identified. • Application of the precautionary approach and exclusion of Category A activities. • Respect for Indigenous and local knowledge related to biodiversity conservation.	IFAD AFCIA PDT, Safeguards Specialist, Grantees	• Completion of environmental screenings and ESMPs for all sub-projects. • No financing of activities on IFAD/SECAP exclusion list. • Monitoring reports confirming implementation of mitigation measures.
Climate Change	Risk of maladaptation if innovations are not context-specific or aligned with local climate risks.	Increased long-term vulnerability, environmental stress, or inequitable outcomes.	Low	• Climate-risk informed design aligned with local climate risks, agroecological conditions, and national priorities (NDCs, NAPs). • Systematic screening for maladaptation risks prior to approval. • Participatory design and stakeholder engagement throughout the innovation cycle. • Phased, learning-oriented implementation allowing adaptation before scaling. • Monitoring systems to detect and address emerging maladaptation risks.	IFAD AFCIA PDT, Safeguards Specialist, Grantees	• Evidence of climate-risk screening in sub-project proposals. • Adjustments made based on learning and monitoring feedback. •Evidence of alignment with national climate priorities.

4. USPs compliance with AF ESP

As outlined in the programme design, the ASAP+ Adaptation Innovation Programme will support a portfolio of innovation grants during implementation. These innovation grants constitute Unidentified Sub-Projects (USPs) at the time of programme approval, as their specific activities, locations, and operational contexts will only be defined following the sourcing and selection of innovation grants. Consequently, while the programme has been screened and classified at a programmatic level, the identification and management of environmental and social risks for USPs will take place during implementation, in full compliance with the Adaptation Fund's Environmental and Social Policy (ESP) and IFAD's Social, Environmental and Climate Assessment Procedures (SECAP).

Screening and pre-selection of USPs

Once innovation proposals are received, each USP will undergo an initial environmental and social risk screening and categorisation using a screening tool aligned with the Adaptation Fund's fifteen Environmental and Social Principles and IFAD's SECAP. This preliminary screening will identify potential environmental and social risks and classify each USP according to its risk level. In line with programme eligibility criteria, Category A activities will not be financed.

At the pre-selection stage, USPs that pass the initial screening will be required to undertake a more detailed assessment proportional to their level of risk. This includes the preparation of a project-specific Environmental and Social Management Plan (ESMP) and a gender assessment, detailing concrete mitigation measures, monitoring arrangements, and institutional responsibilities. Prior to grant approval, the relevant national authorities will be informed, and a government no-objection or endorsement letter will be secured, ensuring alignment with national policies and regulatory frameworks.

Stakeholder engagement and consultations

Consistent with AF ESP and IFAD SECAP requirements, meaningful and inclusive stakeholder consultations will be an integral part of the USP preparation and implementation process. Sub-grantees will conduct consultations with IFAD country teams, relevant government institutions, intended beneficiaries, and other key stakeholders, with particular attention to women, Indigenous Peoples, youth, and other vulnerable or marginalised groups. Feedback from these consultations will be documented and integrated into USP design and ESMPs to ensure that risks are identified early and mitigation measures are context-appropriate.

Implementation, monitoring, and enforcement of safeguards

During implementation, sub-grantees will be responsible for executing their approved ESMPs and ensuring that mitigation measures are effectively applied. IFAD will retain overall oversight responsibility for safeguards compliance through the Programme Design Team and a dedicated Environmental and Social Safeguards Specialist. The programmatic ESMP will be updated as needed to reflect the risk profiles and mitigation measures of the selected USPs, ensuring coherence and consistency across the innovation portfolio.

Safeguards compliance will be monitored through a combination of regular supervision, desk reviews, spot checks, and adaptive management. The grant management system will allow for disbursement of funds in tranches, providing IFAD with the ability to withhold or delay payments in cases of non-compliance with environmental and social requirements. An operational Grievance Redress Mechanism (GRM) will be in place at both programme and USP levels to allow stakeholders to raise concerns related to environmental, social, or gender-related issues.

Reporting and learning

IFAD will report annually to the AF through the Project Performance Report (PPR) on the screening, categorisation, and safeguards performance of the USPs, including any identified risks, mitigation measures applied, and corrective actions taken. This reporting will ensure transparency, accountability, and continuous learning, and will support the programme's adaptive management approach by enabling timely adjustments to mitigate emerging risks and avoid maladaptation.

Through this structured, staged process—spanning screening, assessment, consultation, implementation, monitoring, and reporting—the ASAP+ Adaptation Innovation Programme will ensure that all USPs comply with the Adaptation Fund's Environmental and Social Principles while maximising positive adaptation outcomes for vulnerable rural communities.

Stage	Action	Requirements	Responsible
Screening of micro-grant proposals	Risk screening and categorisation	-Preliminary screening and categorisation of risks based on AF ESP Principles. Category A not funded	Sub- grantee
Pre-selection of proposals	Development of ESMPs for sub-projects	-ESMP development with detailed mitigation measures -Gender assessment -Government no objection letter	Sub- grantee, IFAD PDT
Stakeholder consultations	Stakeholder consultations	-Consultations with IFAD country teams, beneficiaries and government and feedback integration	Sub- grantee, IFAD PDT
Implementation	ESMP execution	-Ensure mitigation measures are applied effectively -Update of programmatic ESMP as necessary	Sub- grantee, IFAD PDT/Safeguards Specialist
Monitoring	Compliance Checks	-Regular reviews and adaptive management based on findings -Annual reporting on performance and compliance with ESP -Operational GRM	Sub- grantee, IFAD PDT/Safeguards Specialist

Table 3. Steps and actions for USPs compliance with AF ESP

Annex **4: Screening Checklist**

Environmental and Social Principle	Screening Questions
Compliance with the Law	Does the project comply with applicable national laws and regulations (labour, health, safety, etc.) and international laws and treaties, and is the prohibited investment activities list produced by the International Finance Corporation adhered to?
Access and Equity	Could the project result in adverse impacts on or changes to land tenure arrangements and/or community-based property rights/customary rights to land, territories and/or resources?
Marginalized and Vulnerable Groups	Could the institution not be providing auxiliary or capacity building support services?
Human Rights	Could the institution not be providing a stable communication channel with stakeholders and local communities (e.g. a Grievance Redress Mechanism)?
Gender Equity and Women's Empowerment	Could the project lead to the potential for gender-based violence, including sexual harassment, exploitation and abuse, as a result of labour influx, land redistribution, or other actions that alter community dynamics?
Core Labour Rights	Could grant activities involve children (a) below the nationally-defined minimum employment age (usually 15 years old) or (b) above the nationally-defined minimum employment age but below the age of 18 in supported activities or in value chains?
	Could grant activities: (a) operate in a sector, area or value chain where producers and other agricultural workers are typically exposed to significant occupational and safety risks, and/or (b) promote or use technologies or practices that pose occupational safety and health (OSH) risks for farmers, other rural workers or rural populations in general? (Note: OSH risks in agriculture might include: dangerous machinery and tools; hazardous chemicals; toxic or allergenic agents; carcinogenic substances or agents; parasitic diseases; transmissible animal diseases; confined spaces; ergonomic hazards; extreme temperatures; and contact with dangerous and poisonous animals, reptiles and insects. Psychosocial hazards might include violence and harassment.)
Indigenous Peoples	Could grant activities adversely affect indigenous people's rights to traditionally owned or otherwise occupied and used lands, territories, waters, coastal seas and other resources and/or livelihood systems?
Involuntary Resettlement	Will grant activities result in temporary or permanent and full or partial physical or economic displacement (including people without legally recognizable claims to land)?
Protection of Natural Habitats	Could the project involve or lead to activities negatively impacting habitats that are legally protected, officially proposed for protection, or recognized as protected by traditional local communities and/or authoritative sources (e.g. National Park, Nature Conservancy, Indigenous Community Conserved Area, (ICCA), etc.)?
Conservation of Biological Diversity	Could grant activities involve or lead to negative impacts/risks to biodiversity, habitats and/or ecosystems and ecosystem services?

Climate Change	Could grant activities be affected by floods (river, coastal, urban), landslides, cyclones, water scarcity, extreme heat or wildfires?
Pollution Prevention and Resource Efficiency	Will grant activities involve or lead to significant consumption of raw materials and energy?
Public Health	Could grant activities involve or lead to negative impacts/risks to communities' health and safety?
Physical and Cultural Heritage	Could grant activities involve or lead to adverse impacts to sites, structures, or objects with historical, cultural, artistic, traditional or religious values or intangible forms of culture (e.g. knowledge, innovations, practices)? (Note: projects intended to protect and conserve Cultural Heritage may also have inadvertent adverse impacts)
Lands and Soil Conservation	Will grant activities involve the development or rehabilitation of irrigation schemes and/or involve or lead to significant extraction, diversion or containment of surface or ground water? (For example, water pans, boreholes, groundwater extraction)
	Will grant activities involve the use of agrochemicals (pesticides, fertilizers, and other modifying agents) which have potential to pollute soils and water bodies or cause other negative impacts?

Annex 5: ASAP+ and IPAF Results Framework

	THIS INDICATOR IS MANDATORY FOR ALL ASAP PROJECTS
ASAP + 1	Poor smallholder household members supported in coping with the effects of climate change
ASAP+2	Households reporting adoption of environmentally sustainable and climate-resilient technologies and practices
ASAP +3	Households reporting a significant reduction in the time spent for collecting water or fuel
ASAP +4	Households supported to increase the diversity of farmed species and varieties
ASAP+5	Groups supported to sustainably manage natural resources and climate-related risks
ASAP+6	Persons provided with climate information services
ASAP +7	Land brought under climate-resilient practices
ASAP +8	Households with increased water availability and/or efficiency for production purposes
ASAP+9	US$ value of new or existing rural infrastructure made climate resilient
ASAP+10	KM of new or existing rural roads that have been made climate resilient
ASAP +11	Existing/new laws, strategies, regulations or policies on climate change and the agricultural sectors proposed to policy makers for approval, ratification or amendment
ASAP +12	Tons of greenhouse gas emissions (CO2e) avoided and/or sequestered
ASAP +13	Persons accessing technologies that sequester carbon or reduce greenhouse gas emissions
ASAP +14	Persons in new green jobs or employment opportunities

Table 1. ASAP+ Results Framework

IPAF Indicator
Indigenous People reporting improvement in land security (APR and LAC) and in Access to land, territories and natural resources (APR only)
of hectares of land secured and protected (APR)
# of land certificates/titles grandted (Africa)
# of hectares of land managed by Indigenous Peoples under sustainable management practices
% increase of production
# of households reporting an increase in income
# of Indigenous People trained in land and natural resources management, sustainable and climate-resilient agriculture, traditional practice, and community empowerment
# of market, processing or storage facilities constructed or rehabilitated
# of indigenous households with improved access to clean water (APR) and to clean cooking technologies (Africa)

Table 2. IPAF Results Framework