

Reducing smallholder vegetable farmers' vulnerability to climate change impacts, including water scarcity, in Mongolia through ecosystem-based adaptation (EbA) and digitalized risk mitigation insurance solutions

Inception Report

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Climate Technology Centre and Network (CTCN)

Mongolia



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1 Introduction

The United Nations Environment Programme (UNEP), through the Climate Technology Centre and Network (CTCN), supports developing countries in accelerating the deployment and transfer of climate technologies for both mitigation and adaptation. Through the provision of Technical Assistance (TA), capacity building, and policy advisory services, CTCN responds to country-driven requests and supports the transition toward climate-resilient and low-emission development pathways. [R1]

In this context, the present TA responds to a request from the Government of Mongolia to strengthen climate resilience in the agricultural sector. The focus is on identifying, validating, and scaling innovative and context-appropriate solutions for smallholder vegetable farmers, particularly in response to increasing water scarcity and climate variability. [R2]

By addressing these challenges, the TA seeks to enhance agricultural productivity, improve household incomes, and strengthen national food security, while increasing the resilience of vulnerable farming communities to climate change. [R2]

The purpose of this Inception Report (IR) is to guide the operationalisation of the project and establish its overall implementation framework. The IR defines the project's strategy, scope, and methodology; updates relevant information from the original project document; and outlines the implementation schedule for the full project period. It further proposes institutional linkages, as well as management and coordination arrangements, and reflects any changes in the project context, including associated risks.

In addition, the IR provides implementation guidelines for project partners and presents updates to the detailed budget and selected indicators for measuring project outcomes. Activity details are described alongside institutional responsibilities, timelines, and resource allocations.

As such, this IR serves as a foundational document for refining implementation plans, establishing baselines, and supporting monitoring and evaluation throughout the project lifecycle.

1.1 Project context

Smallholder vegetable farmers in Mongolia face increasing risks and vulnerability due to climate change, harsh agro-ecological conditions, and structural limitations in agricultural production and support systems. With a short growing season of only 3–4 months, limited access to irrigation, and high climate variability, vegetable production remains uncertain, labour-intensive, and inefficient. These challenges threaten household food security, reduce income opportunities, and weaken the resilience of rural communities. [R2, R6]

Agriculture plays an important but declining role in Mongolia's economy, contributing approximately 10.2% of Mongolia's GDP in 2022, and decreasing to 7.4% in 2024, due to repeated climate-related shocks, particularly dzud events. The sector is heavily dominated by livestock, which accounts for 83–85% of agricultural value, while crops contribute only 15–17%. Within this, vegetable production represents just 4–5% of cultivated land. Despite its relatively small share, vegetable production has expanded significantly, meeting around 80% of national demand in 2024, compared to approximately 60% in 2022. This trend reflects growing national efforts to strengthen food security, reduce import dependence and stabilize prices. [R5, R6, R7]

However, production systems remain largely underdeveloped. Mechanisation levels are low (approximately 38%), and around 96.5% of farmers rely on inefficient surface irrigation methods. Climate-resilient technologies such as durable greenhouses and modern irrigation systems are either absent or limited to fragile structures that cannot withstand Mongolia's extreme weather conditions, including strong winds, storms, and hail. In addition, there are currently no insurance products available for vegetable farming, leaving smallholders highly exposed to climate-related losses. [R2, R5, R6]

These constraints translate into three critical system gaps: (i) lack of climate-resilient production technologies, (ii) absence of enabling policy and quality standards, and (iii) limited access to finance and risk mitigation tools. [R2, R6]

The TA is structured to address these gaps through the following outputs:

- Output 1: Technology feasibility assessment (addressing the technology gap)
- Output 2: Policy and legislative framework (addressing the enabling environment gap)
- Output 3: Financing and insurance mechanisms (addressing the financial risk gap)
- Outputs 4–5: Capacity building and scale-up (supporting adoption and sustainability)

An estimated 150,000 smallholder vegetable farmers operate across Mongolia, most cultivating less than one hectare for subsistence and small-scale market sales. Production is highly fragmented, with limited cooperative structures to enable economies of scale. While land availability is not a major constraint—local authorities have indicated that additional land can be allocated—the main barriers lie in the lack of integrated solutions, including sustainable irrigation, resilient greenhouse systems, climate-adaptive practices, and accessible financial and insurance mechanisms. [R2, R6]

At the same time, important opportunities exist. Government commitment to expanding vegetable production is strong, and domestic production has already shown rapid growth. The challenge now is to transition from fragmented, small-scale practices to more integrated, climate-resilient, and economically viable systems. Addressing these gaps requires a holistic approach that combines technology, policy support, and financial innovation. [R3, R4, R5, R6]

This TA responds directly to these needs by developing a bankable and scalable proof of concept that integrates ecosystem-based adaptation (EbA), climate-resilient technologies, and digitalized risk mitigation solutions, thereby strengthening the resilience and productivity of smallholder vegetable farmers in Mongolia. [R1, R2]

1.2 Climate Policy Background

Mongolia is highly vulnerable to climate variability and long-term climatic changes due to its harsh continental climate and strong dependence on climate-sensitive sectors, particularly agriculture. In recent decades, the country has experienced rising temperatures, changing precipitation patterns, and an increasing frequency and intensity of extreme weather events. Among these, dzud events—characterized by severe winter conditions following summer droughts—have become more frequent and severe, with significant impacts on rural livelihoods and agricultural productivity. [R3, R4]

The agricultural sector is particularly exposed to these climate risks. Increasing water scarcity, land degradation, and climate variability are constraining crop production and reducing the reliability of farming systems. Smallholder farmers are disproportionately affected due to limited access to climate-resilient technologies, financial resources, and effective risk mitigation mechanisms. [R3, R4, R6]

In response, the Government of Mongolia has established a comprehensive policy framework to address climate change, including its Nationally Determined Contribution (NDC) under the Paris Agreement and the National Adaptation Plan (NAP). These frameworks prioritize climate adaptation in agriculture, sustainable water resource management, and the promotion of climate-resilient technologies, with a strong emphasis on enhancing food security and adaptive capacity. [R3, R4, R5]

Despite this enabling policy environment, significant implementation challenges remain. Access to finance is limited, deployment of appropriate technologies is insufficient, and linkages between policy, practice, and market systems are not yet fully developed. As a result, policy commitments have not consistently translated into large-scale adoption of climate-resilient solutions on the ground. [R2, R3, R4]

This gap between policy ambition and implementation underscores the need for integrated approaches that combine technology deployment, enabling policy frameworks, and innovative financing mechanisms. Building on this context, the proposed Technical Assistance is designed to align closely with national priorities

while addressing key barriers to implementation, thereby supporting the transition toward a more resilient and sustainable agricultural system. [R2, R3, R4, R12]

1.3 Alignment with National Priorities

The proposed technology concept is directly aligned with Mongolia's national climate and development priorities, ensuring that the project supports ongoing government strategies and contributes to sustainable development outcomes. Key points of alignment include: [R3, R4, R5, R12]

1. National Development Strategy and Sector Plans

- Supports Mongolia's overarching development goals, including economic diversification, sustainable natural resource management, and climate-resilient growth.
- Complements sector-specific strategies such as agriculture, forestry, and water resource management, ensuring coherence with existing plans.

2. Climate Policy and Environmental Commitments

- Directly contributes to the implementation of Mongolia's Nationally Determined Contributions (NDCs) under the Paris Agreement.
- Supports climate adaptation and mitigation priorities identified in national climate action plans, including sustainable land use, ecosystem protection, and renewable energy adoption.

3. Legislative and Regulatory Framework

- Aligns with existing laws and regulations related to environmental protection, water management, and agricultural development.
- Ensures that project interventions reinforce national standards, rather than creating parallel or conflicting initiatives.

4. Socio-Economic Development Goals

- Promotes inclusive growth by engaging communities, smallholder farmers, and vulnerable groups.
- Encourages private sector participation in sustainable practices, enhancing local livelihoods while reducing environmental risks.

By aligning with national priorities, the initiative ensures relevance, facilitates government ownership, and strengthens the likelihood of long-term sustainability and impact.

In line with these national priorities, the TA is designed to operationalize these strategic commitments through a structured and results-oriented intervention.

1.4 The Objective

Building on the identified policy and implementation gaps, and in alignment with Mongolia's national development and climate priorities, this Technical Assistance (TA) aims to support the transition from fragmented pilot interventions toward an integrated, scalable, and climate-resilient system for smallholder vegetable production. [R2, R3, R4, R12]

The overall objective of the TA is to design and validate an investment-ready proof of concept for ecosystem-based adaptation (EbA) in smallholder vegetable farming in Mongolia, with a geographic focus on Dundgovi and Uvurkhangaï provinces. The TA seeks to reduce the vulnerability of smallholder farmers to climate change by integrating climate-resilient technologies with appropriate policy frameworks and financial risk mitigation instruments. [R2]

Specifically, the TA will:

- Identify and validate suitable and cost-effective climate adaptation technologies for smallholder vegetable production, with a focus on improving water efficiency, productivity, and resilience to drought and extreme temperatures;
- Develop and support the institutionalization of national guidelines and certification standards for key technologies, including solar-powered irrigation systems, greenhouse infrastructure, and agroforestry practices, to ensure quality, safety, and sustainability;
- Design a blended finance mechanism and a digitally enabled crop insurance product to de-risk private sector participation, improve access to finance for farmers, and provide tailored risk protection;
- Formulate a comprehensive implementation and scale-up strategy, including financing pathways and institutional arrangements, to ensure long-term sustainability and replicability beyond the scope of the TA;
- Strengthen national and local capacities through targeted training, stakeholder consultations, and participatory workshops, and develop scale-up project concept notes aligned with potential donor financing opportunities.

Through these interventions, the TA is expected to enhance the resilience, productivity, and economic viability of smallholder vegetable farming systems in Mongolia. At the policy level, it will contribute to the implementation of national priorities, including Mongolia's Nationally Determined Contribution (NDC), Technology Needs Assessment (TNA), National Adaptation Plan (NAP), and Vision-2050 development framework. [R2, R3, R4, R12]

Table 1. Outputs of the Technical Assistance

Output 1: Inception workshop and technology options
Output 2: Policy and Legislative Framework for Standards
Output 3: Financing Structure and Digitalized Insurance Scheme
Output 4: Capacity Building and Training
Output 5: Implementation Roadmap and Sustainability Financing Strategy, including two Scale-up Project Concept Notes

2 Methodology

2.1 Overall Approach

The Technical Assistance (TA) will be delivered through a set of structured and interlinked activities organized across five outputs. Each activity is designed to generate actionable results that feed into subsequent stages of the assignment, culminating in a scalable and investment-ready proof of concept for climate-resilient smallholder vegetable farming in Mongolia.

The approach is fully aligned with the Terms of Reference (TOR), which define an 18-month TA structured around five outputs and associated deliverables across inception, implementation, and closure phases. It is also consistent with the methodologies and guidance of the Climate Technology Centre and Network (CTCN), as well as Mongolia's national priorities, including the Nationally Determined Contribution (NDC), National Adaptation Plan (NAP), and Vision-2050 development framework. [R2]

The methodology is designed to translate identified system gaps—namely, limited access to climate-resilient technologies, weak enabling policy frameworks, and constrained financial and risk mitigation mechanisms—into integrated and implementable solutions. In doing so, it ensures that each activity directly contributes to the development of a bankable and scalable model that can be replicated and expanded beyond the scope of the TA. [R2]

The assignment adopts an integrated, participatory, and iterative approach that combines technical analysis, stakeholder engagement, and continuous validation. Stakeholder consultations at national and subnational levels will be systematically used to validate assumptions, refine analytical outputs, and ensure that proposed solutions are context-specific, practical, and aligned with institutional and market realities.

Key pillars of the approach include:

- **Participatory stakeholder engagement:** Continuous engagement with government institutions, farmers, cooperatives, private sector actors, and financial and insurance stakeholders to ensure ownership, relevance, and feasibility of outputs;
- **Evidence-based technical and economic analysis:** Rigorous feasibility assessments of climate-resilient technologies, including solar-powered irrigation, greenhouse systems, and agroforestry, supported by cost-benefit analysis and environmental sustainability considerations;
- **Institutional and financial system strengthening:** Development of enabling policy frameworks, certification standards, blended finance structures, and digital crop insurance solutions to address systemic barriers to adoption and scale-up;
- **Capacity building and knowledge transfer:** Targeted training and institutional strengthening to support long-term adoption, replication, and sustainability of proposed solutions.

The approach is inherently adaptive and iterative. Analytical methods, assumptions, and proposed solutions will be refined throughout the assignment based on emerging data, stakeholder feedback, and evolving contextual conditions. This ensures that the final outputs are not only technically robust but also operationally feasible and responsive to Mongolia's dynamic climate and agricultural context.

Overall, the TA is designed to move beyond isolated interventions toward an integrated systems approach, linking technology, policy, finance, and capacity development into a coherent framework that enables sustained impact, scalability, and long-term resilience in the agricultural sector.

2.2 Implementation Framework

The TA will be implemented over an 18-month period in accordance with the CTCN project management framework, ensuring transparency, accountability, and methodological rigor. The implementation is structured across three phases: inception, implementation, and closure. [R2]

The consortium will adopt a participatory and adaptive management approach, integrating monitoring and evaluation, gender equality, and sustainability considerations from the outset. This approach is aligned with the CTCN project management framework and the Response Plan requirements. [R2]

2.2.1 Project Governance and Oversight

To ensure strategic guidance, coordination, and accountability, a project coordination mechanism will be maintained throughout implementation. In line with feedback received during the inception consultations, this mechanism is expected to operate as an informal Working Group rather than a formal Project Steering Committee, while retaining the oversight, coordination, and reporting functions foreseen in the Response Plan. [R2]

The Working Group will comprise representatives from the implementing consortium (international and national experts), the National Designated Entity (NDE), relevant government institutions, project proponents, Mongolian Re, and the CTCN Secretariat.

The Working Group will meet at key milestones and, where required, on a biannual basis to:

- Review progress against planned activities and deliverables;
- Validate key outputs and provide strategic guidance;
- Address implementation challenges and facilitate coordination among stakeholders;
- Ensure alignment with national policies, including the NDC, NAP, and Vision-2050 framework.

As the national anchor institution, CCRCC will play a central role in ensuring that project discussions and outputs are embedded within Mongolia's policy and institutional landscape. Mongolian Re will provide technical input on financial and insurance components, ensuring alignment with market realities and regulatory frameworks. The lead implementing firm will ensure overall methodological quality and compliance with CTCN standards.

Working Group/coordination meetings will be documented through formal reports, capturing key decisions, agreed actions, and follow-up responsibilities to ensure transparency, traceability, and consistency with CTCN reporting requirements.

2.2.2 Implementation Phases

The TA will be implemented through three main phases, consistent with CTCN requirements and the TOR:

Inception Phase (Pre-implementation)

During the inception phase, the consortium will establish the operational and analytical foundation of the project. This includes the preparation of:

- A detailed workplan and budget, mapping activities, responsibilities, timelines, and deliverables;
- A Monitoring and Evaluation (M&E) Plan aligned with CTCN reporting requirements;
- A Gender Action Plan to ensure gender-responsive implementation.

These deliverables will be developed based on the Response Plan and validated with key stakeholders to ensure alignment with national priorities and institutional arrangements.

Implementation Phase

The implementation phase will involve the execution of technical, policy, financial, and capacity-building activities across Outputs 1–5. Activities will be carried out in close coordination with national and local stakeholders, ensuring continuous validation of findings and outputs.

Stakeholder engagement will be embedded throughout this phase through:

- Bilateral consultations with key institutions and experts;
- Thematic technical discussions;
- Validation workshops at critical stages of the assignment.

This iterative engagement process ensures that outputs remain context-specific, feasible, and aligned with stakeholder needs, thereby enhancing ownership and likelihood of adoption.

Closure Phase (Post-implementation)

At the conclusion of the TA, the consortium will prepare a comprehensive Closure and Data Collection Report in line with CTCN requirements. This will include:

- Consolidated results and impact assessment;
- Lessons learned and recommendations for future interventions;
- Documentation of outcomes and pathways for scale-up.

In collaboration with the CTCN Secretariat, the consortium will also implement dissemination and knowledge-sharing activities, such as a final workshop, webinar, and stakeholder dialogues with financial institutions and potential donors to support scale-up and replication.

Monitoring and Evaluation

A robust Monitoring and Evaluation (M&E) system will be established at the inception stage to track progress, assess performance, and support adaptive management. The system will be aligned with CTCN templates and requirements and will incorporate SMART indicators to measure both outputs and outcomes.

SMART indicators will ensure that results are:

- **Specific:** Clearly linked to defined outputs and outcomes;
- **Measurable:** Quantifiable or verifiable through data collection;
- **Achievable and attributable:** Reflecting changes directly linked to project interventions;
- **Relevant:** Aligned with project objectives and national priorities;
- **Time-bound:** Tracked within defined timeframes.

The M&E system will go beyond tracking deliverables to assess broader outcomes, including adoption of climate-resilient technologies, improved access to finance and insurance, and enhanced resilience of smallholder farmers.

Findings from the M&E process will be used to inform ongoing implementation, allowing for adjustments to methodologies, assumptions, and activities as needed.

2.2.3 Cross-cutting Considerations

Gender Equality and Social Inclusion

A Gender Action Plan will be developed and implemented in line with CTCN gender mainstreaming requirements and the OECD DAC Gender Marker. The project will actively promote the participation of women and vulnerable groups, with targeted measures to: [R1, R14]

- Engage women-led cooperatives and farmer groups;
- Ensure equitable access to training, finance, and insurance products;
- Address structural barriers to participation and inclusion.

Gender-disaggregated data will be collected and monitored throughout the project to assess progress and inform adaptive measures.

Sustainability and Capacity Development

Sustainability considerations will be integrated across all outputs to ensure that project results are maintained and scaled beyond the TA period. This includes:

- Strengthening institutional capacities at national and local levels;
- Embedding knowledge within extension services and training institutions;
- Promoting private sector engagement and ownership of solutions.

Overall, this implementation framework ensures that the TA is delivered in a structured, transparent, and results-oriented manner, while maintaining the flexibility required to respond to emerging insights and evolving conditions. It provides a strong foundation for achieving project objectives and enabling long-term impact in Mongolia's agricultural sector.

2.3 Output-based Methodology

The Technical Assistance (TA) is structured around five interrelated outputs, each contributing to the development of a coherent, scalable, and investment-ready framework for climate-resilient smallholder vegetable farming in Mongolia. The methodology for each output combines analytical rigour, stakeholder engagement, and iterative validation to ensure that results are both technically sound and operationally feasible. [R2]

Output 1: Technology Feasibility and Assessment

This output establishes the technical and analytical foundation of the TA by identifying, assessing, and prioritizing climate-resilient technology options suitable for smallholder vegetable farmers.

The methodology will combine field-based assessments, data analysis, and stakeholder consultations. Initial activities will include a baseline assessment and consolidation of available data on agricultural practices, climate conditions, water resources, and production systems. Data gaps and inconsistencies will be identified and addressed through targeted fieldwork and consultations.

Feasibility studies will be conducted in the target provinces of Dundgovi and Uvurkhangai, focusing on solar-powered irrigation systems, greenhouse production models, and agroforestry practices. These assessments will evaluate technical performance, suitability to local agro-ecological conditions, and resilience to climate risks. [R2]

A structured economic and financial analysis, including cost-benefit assessments, will be undertaken to determine the viability of each technology option across different farm sizes and production models. Environmental sustainability considerations, including water availability and risks of maladaptation (e.g., groundwater over-abstraction), will be integrated into the analysis.

The results will be synthesised into a practical “technology menu,” serving as a decision-support tool for farmers, policymakers, and investors. The menu will include technical specifications, cost ranges, and suitability criteria, and will be validated through stakeholder consultations to ensure relevance and usability.

Output 2: Policy and Certification Framework

This output focuses on strengthening the enabling environment by aligning technology deployment with national policies, regulatory frameworks, and quality standards.

The methodology will begin with a comprehensive review and mapping of existing policies, laws, and technical standards related to irrigation, greenhouse infrastructure, agroforestry, and water resource management. A gap analysis will identify areas where current frameworks do not adequately support the adoption of climate-resilient technologies.

Building on the findings from Output 1, draft national guidelines and certification standards will be developed, particularly for solar-powered irrigation systems. These will include sustainable water use thresholds, technical specifications, and quality assurance requirements for installation and operation.

Agroforestry practices will be integrated into the policy framework through the development of practical guidance and recommendations for incorporation into existing forestry and agricultural policies. This will include considerations for species selection, system design, and farm-level application.

All policy recommendations and draft standards will be developed through a consultative process involving relevant ministries, technical institutions, private sector actors, and farmer organizations. Validation workshops will ensure that outputs are aligned with national priorities, institutionally feasible, and ready for potential adoption.

Output 3: Financing Mechanisms and Digital Crop Insurance

This output addresses financial barriers to adoption by designing a blended finance mechanism and a digital crop insurance product tailored to smallholder vegetable farmers.

The methodology will follow a market-informed and data-driven approach. It will begin with an assessment of the financial landscape, including commercial banks, microfinance institutions, government funds, and donor programmes, to understand existing financing conditions and constraints.

Based on this analysis, a blended finance structure will be developed, combining public and private funding sources, concessional financing, and risk-sharing instruments. The design process will include engagement with financial institutions and policymakers to ensure feasibility and alignment with national priorities.

In parallel, a digital crop insurance product will be designed to address the absence of risk transfer mechanisms in the sector. The approach will explore appropriate insurance models, including weather-index, hybrid, and technology-enabled solutions such as satellite-based monitoring and picture-based insurance.

Given data limitations, the methodology will incorporate alternative data sources, including remote sensing and open-access climate datasets, to support product design and risk modelling. Engagement with insurers, reinsurers, and technology providers will be undertaken to ensure technical robustness and market viability. [R9, R10, R11]

The financing and insurance solutions will be developed through a co-design process involving farmers, financial institutions, and insurance providers, ensuring that products are accessible, affordable, and aligned with user needs. The output will include a bankable financing structure, a pilot-ready insurance concept, and a framework for risk-sharing partnerships.

Output 4: Capacity Building and Training

This output aims to strengthen individual and institutional capacities to support the adoption, operation, and scaling of climate-resilient technologies and financial solutions.

The methodology will adopt a structured and inclusive approach, beginning with a needs assessment to identify capacity gaps among key stakeholder groups, including farmers, cooperatives, extension services, financial institutions, and insurers.

Based on this assessment, tailored training materials and curricula will be developed, covering technical, financial, and risk management topics. Training content will be differentiated by target group and designed to be practical, accessible, and context-specific.

Training delivery will combine theoretical instruction with hands-on learning approaches, including demonstration sites and pilot applications. A Train-the-Trainers model will be applied to build local capacity for ongoing knowledge dissemination.

To ensure sustainability, the project will support the establishment or strengthening of provincial training hubs or centres of excellence, in collaboration with local institutions. These hubs will serve as long-term platforms for knowledge sharing, technical support, and continued capacity development beyond the duration of the TA.

Output 5: Implementation Roadmap and Financing Strategy

This output consolidates all findings into a coherent framework for national scale-up, ensuring long-term impact and sustainability.

The methodology will involve the synthesis of technical, policy, financial, and capacity-building components into a phased implementation roadmap, outlining short-, medium-, and long-term actions for scaling climate-resilient vegetable farming.

A sustainability financing strategy will be developed to identify and mobilize resources for implementation beyond the TA. This will include mapping potential funding sources, defining institutional roles, and identifying opportunities for public-private partnerships.

Two bankable project concept notes will be prepared in line with donor requirements, demonstrating the scalability and investment readiness of proposed solutions. These concept notes will be informed by the results of all previous outputs and validated through stakeholder consultations.

Final outputs will be presented and validated through stakeholder workshops, ensuring alignment with national priorities and securing institutional ownership. This process will facilitate the transition from analytical outputs to implementation and investment.

2.4 Workplan

The Technical Assistance (TA) will be implemented over a period of 18 months, structured around five sequential and interlinked outputs. The workplan is designed to ensure a logical progression from analytical assessments to policy development, financial structuring, capacity building, and ultimately, the formulation of a scalable implementation roadmap. [R2]

Activities are organized to allow for iterative feedback, stakeholder validation, and adaptive management throughout the project lifecycle. Overlapping phases are incorporated where appropriate to enhance efficiency and ensure continuity between outputs.

2.4.1 Phasing and Sequencing

The implementation will follow a phased approach:

- **Phase 1 (Months 1–3):** Inception and Technology Assessment (Output 1), including stakeholder validation and feasibility analysis;
- **Phase 2 (Months 4–7):** Policy and Regulatory Framework Development (Output 2), building on technical findings;
- **Phase 3 (Months 8–12):** Design of Financing Structures and Insurance Solutions (Output 3), informed by Outputs 1 and 2;
- **Phase 4 (Months 13–16):** Capacity Building and Training (Output 4), supporting adoption and institutional strengthening;
- **Phase 5 (Months 17–18):** Consolidation, Implementation Roadmap, and Scale-up Strategy (Output 5).

This sequencing ensures that each output builds on the results of the previous stage while allowing for continuous stakeholder engagement and validation.

2.4.2 Key Milestones and Deliverables

Key milestones are aligned with the delivery of outputs and CTCN reporting requirements:

- **Month 1:** Submission of inception deliverables, including detailed workplan, Monitoring and Evaluation (M&E) Plan, and Gender Action Plan;
- **Month 3:** Completion of Output 1, including feasibility studies, cost–benefit analysis, and technology menu;
- **Month 7:** Completion of Output 2, including policy review and draft guidelines and standards;
- **Month 12:** Completion of Output 3, including blended finance structure and digital insurance concept;
- **Month 16:** Completion of Output 4, including training delivery and establishment of capacity-building structures;
- **Month 18:** Submission of final outputs, including implementation roadmap, financing strategy, scale-up concept notes, and Closure Report.

Working Group/coordination meetings will be held at key milestones to review progress, validate deliverables, and provide strategic guidance. Where CTCN templates refer to Project Steering Committee meeting reports, the project will submit Working Group/coordination meeting reports serving the same reporting function. [R2]

2.4.3 Activity Scheduling

Each output comprises a set of activities and deliverables, implemented within defined timeframes:

- **Output 1 (Months 1–3):** Inception workshop, field-based feasibility studies, cost–benefit analysis, and development of the technology menu;
- **Output 2 (Months 4–7):** Policy mapping and gap analysis, development of national guidelines and certification standards, and integration of agroforestry into policy frameworks;
- **Output 3 (Months 8–12):** Financial landscape assessment, design of blended finance mechanisms, development of digital crop insurance solutions, and establishment of risk-sharing frameworks;
- **Output 4 (Months 13–16):** Development of training materials, delivery of workshops and Train-the-Trainers programmes, and establishment of provincial training hubs or centres of excellence;

- **Output 5 (Months 17–18):** Consolidation of findings, development of implementation roadmap and financing strategy, preparation of scale-up concept notes, and final dissemination activities.

Cross-cutting activities, including stakeholder engagement, monitoring and evaluation, and gender mainstreaming, will be implemented continuously throughout the project duration.

2.4.4 Adaptive Management and Coordination

The workplan is designed to remain flexible and responsive to emerging insights and contextual changes. Regular coordination among project partners, combined with continuous stakeholder engagement, will allow for adjustments in activity sequencing, analytical approaches, and implementation modalities as needed.

This adaptive approach ensures that the TA remains aligned with stakeholder needs, evolving data availability, and policy developments, while maintaining overall coherence and timely delivery of outputs.

3 Preliminary Findings

3.1 Insurance Landscape Assessment

Preliminary findings indicate that Mongolia has made important progress in agricultural risk financing, particularly through the establishment of an index-based livestock insurance scheme operating on a commercial basis. This scheme demonstrates the viability of market-based approaches when supported by strong institutional frameworks and risk-sharing arrangements. [R8, R13]

However, similar progress has not been observed in the crop insurance segment. Previous crop insurance pilots, including index-based products, have encountered significant challenges in achieving technical feasibility, farmer uptake, and long-term sustainability. These experiences highlight structural constraints in extending effective risk protection to smallholder crop producers, who remain highly exposed to climate variability and extreme weather events. [R2, R8]

3.2 Feasibility of Technology-Enabled Insurance Solutions

The assessment highlights that alternative and technology-enabled approaches may provide more suitable entry points than traditional models. [R9, R10, R11]

Promising solutions include: [R9, R10, R11]

- **Satellite-supported insurance**, enabling remote monitoring of weather and crop conditions;
- **Picture-based insurance**, allowing farmers to submit visual evidence of losses;
- **Synthetic weather datasets**, which address gaps in ground-based data infrastructure;
- **Digital platforms and mobile payments**, facilitating enrollment, premium collection, and rapid payouts.

These approaches can significantly reduce administrative costs, improve data accuracy, and enable scalability across dispersed rural populations. Importantly, they also contribute to reducing basis risk when combined with localised data sources. [R9, R10, R11]

3.3 Blended and Layered Microinsurance Model (Emerging Approach)

The preliminary assessment indicates that agricultural risks affecting smallholder vegetable farmers cannot be effectively addressed through a single insurance product or by a single institution. Climate-related losses vary in frequency, severity, and scale, while farmers' capacity to absorb risk is limited. For this reason, the emerging approach is to develop a blended and layered microinsurance model that combines insurance, public risk-sharing, farmer self-retention, digital tools, and existing agricultural finance channels. This approach is consistent with international good practice for agricultural insurance and with Mongolia's experience in index-based livestock insurance. [R8, R13]

At the core of the model would be a simple index-based or parametric insurance layer, using weather, yield, or hybrid indicators to trigger payouts when pre-defined thresholds are reached. Such a model can reduce claims verification costs, enable faster and more transparent payouts, and support scalability across dispersed farming communities. However, given the diversity of vegetable crops, localised production conditions, and limited historical data, the product should initially be developed as a pilot-ready concept rather than a fully

commercial product. Further data collection, stakeholder validation, and actuarial testing will be needed before implementation. [R9, R10, R13, R15]

To improve uptake and affordability, insurance should not be offered as a stand-alone product. Instead, it should be bundled with existing agricultural and financial services, such as seasonal credit, microfinance, input supply packages, greenhouse or irrigation investments, and cooperative-based service delivery. Bundling insurance with credit or inputs can help align premium payments with farmers' production cycles, reduce transaction costs, and make insurance more relevant to farmers' immediate investment decisions. It can also support financial institutions by reducing climate-related default risk. [R9, R15]

The proposed model should also apply a layered risk-sharing structure (Table 2). Frequent and low-impact losses would remain largely with farmers through self-retention and improved farm-level risk management practices. Medium-level risks could be transferred to insurers, MFIs, or other financial intermediaries through an affordable insurance product. Catastrophic risks, which are too large or systemic for the private market to absorb alone, would require public or donor-backed support, potentially through premium subsidies, guarantee mechanisms, contingency funds, or reinsurance arrangements. [R8, R13, R15]

Table 2. Risk-layering model

Risk Layer	Type of Risk	Risk Bearer
Layer 1	Frequent, low-impact losses	Farmers (self-retention)
Layer 2	Medium-level risks	Insurers / MFIs
Layer 3	Catastrophic risks	Government and donors

This structure reflects international good practice and aligns with Mongolia's existing livestock insurance scheme. [R8, R13, R15]

A strong digital and data infrastructure will be essential to make the model operational. This may include satellite and weather data, mobile-based farmer registration, digital premium collection, digital claims notification, and mobile payment systems. These tools can reduce operational costs, improve transparency, and support the gradual scaling of insurance services beyond the pilot provinces. At the same time, the use of digital tools should remain proportionate to farmers' capacities and local connectivity conditions, ensuring that the insurance product is accessible, understandable, and trusted by smallholder users. [R9, R10, R11]

Overall, the proposed blended and layered model should be understood as an emerging design direction. Its value lies in combining risk transfer with finance, technology adoption, public support, and digital delivery. The next stage of the Technical Assistance should therefore focus on testing the feasibility of this model with insurers, financial institutions, farmer groups, and public stakeholders, while identifying the data requirements, institutional roles, and risk-sharing arrangements needed to move toward a pilot implementation.

3.4 Key Design Principles and Implementation Challenges

The findings further identify critical design principles required to ensure successful implementation: [R9, R10, R11, R15]

3.4.1 Design Principles

- **Affordability:** Through subsidies, cross-subsidisation, or blended finance mechanisms
- **Trust and Simplicity:** Clear, transparent payout rules to build farmer confidence
- **Scalability:** Leveraging aggregators such as cooperatives, MFIs, and agribusinesses

- **Speed of Payout:** Parametric triggers enabling rapid disbursement
- **Basis Risk Reduction:** Combining satellite, weather, and localised data

3.4.2 Key Challenges and Solutions

The challenges summarised below confirm the need for a hybrid system combining financial innovation, institutional coordination, and technology integration. [R9, R13, R15]

Table 3. Key challenges and solutions

Challenge	Implication	Proposed Direction
High premiums	Low uptake	Subsidies and donor support
Low adoption	Limited scaling	Bundling with credit and inputs
High admin costs	Reduced insurer interest	Digital and index-based systems
Catastrophic risk exposure	Market instability	Reinsurance and government backstop
Trust deficit	Farmer reluctance	Cooperative-based delivery models

3.5 Financial and Institutional Structuring (Blended Approach)

The preliminary findings emphasise that a public-private partnership (PPP) and blended finance model is essential. [R13, R15]

Roles and Contributions

- Public sector:
 - Premium subsidies
 - Investment in data infrastructure
- Private sector (insurers, MFIs):
 - Product design and underwriting
 - Claims management
- Donors and development partners:
 - Innovation funding
 - Guarantees and risk-sharing support

In addition, mutual or cooperative risk-pooling mechanisms can complement commercial insurance by strengthening local ownership and participation. [R15]

3.6 Product Design and Scaling Considerations

A major constraint identified is the limited number of crop farmers in specific provinces, which restricts geographic risk diversification. [R5, R6]

To address this:

- Products must be designed for rapid scaling across provinces
- Standardized solutions are preferred over crop-specific products

One promising approach is a combined greenhouse insurance product, covering both infrastructure and crops. This allows nationwide applicability and improves the commercial viability of insurance offerings. [R9, R15]

3.7 Conclusion on preliminary findings

Overall, the preliminary findings demonstrate that while technical, financial, and institutional barriers persist, there is a clear pathway toward developing a scalable and bankable microinsurance system in Mongolia. [R2, R8, R9, R13, R15]

The evidence strongly supports a shift from stand-alone insurance products toward a blended, layered, and technology-enabled approach, combining: [R8, R9, R10, R13, R15]

- Risk-sharing across stakeholders,
- Integration with financial and agricultural systems, and
- Digital innovation for delivery and scalability.

These findings provide a solid analytical foundation for the next phase of the project, including feasibility assessment, product design, and pilot implementation.

Annexes

Annex 1. Detailed Workplan and Deliverables

Output 1. Inception workshop and technology options

Activity 1	Deliverables DA. D.1.1. D.1.2. D.1.3. D.1.4. D.B1.	Month 1-3
Activity A: Pre-implementation	Deliverables D.A. Detailed work plan; M&E plan; GAP	Month 1
Activity 1.1: Inception workshop	D.1.1. Inception workshop report including the list of stakeholders, meeting minutes with the list of participants, disaggregated by gender, materials used for the workshops and photos of the event.	Month 1
Activity 1.2: Conduct feasibility studies on solar-powered irrigation, greenhouse solutions, and agroforestry practices in Dundgovi and Uvurkhangai.		
■ 1.2.1. Site Assessments ■ 1.2.2. Technology Review ■ 1.2.3. Stakeholder Engagement ■ 1.2.4. Preliminary Technical Recommendations	D.1.2. Feasibility study report (solar irrigation, greenhouses, agroforestry).	Month 2-3
Activity 1.3: Perform cost-benefit analysis for each technology option to prevent maladaptation (over-abstraction).		
■ 1.3.1. Cost-Benefit Data Collection ■ 1.3.2. Water Resource Appraisal ■ 1.3.3. Socio-Economic Analysis ■ 1.3.4. Risk of Maladaptation ■ 1.3.5. Consolidated CBA Report	D.1.3. Cost-benefit analysis report	Month 2-3
Activity 1.4: Consolidate a “technology menu” with recommendations on climate-resilient farming techniques, greenhouse designs, and potential agroforestry models.		
■ 1.4.1. Synthesis of Findings ■ 1.4.2. Technical Specifications ■ 1.4.3. Dissemination ■ 1.4.4. Stakeholder Validation	D.1.4. Technology menu (catalogue/fact sheets) with practical guidelines for farmers.	Month 3
Activity B1: Working Group/coordination meeting	Deliverables D.B1. Working Group/coordination meeting report	Month 3

Output 2: Policy and Legislative Framework for Standards

Activity 2	Deliverables D.2.1. D.2.2. D.2.3. D.B2.	Month 4-7
Activity 2.1: Review existing policies and standards for irrigation, agroforestry, and greenhouse infrastructure.		
■ 2.1.1. Policy Mapping ■ 2.1.2. Gap Analysis ■ 2.1.3. Stakeholder Consultations	D.2.1. Policy review report detailing gaps in current frameworks.	Month 4-5
Activity 2.2: Develop a national guideline and certification standards for solar-powered irrigation, including thresholds for sustainable water usage.		
■ 2.2.1. Guideline Drafting ■ 2.2.2. Certification Scheme ■ 2.2.3. Consultative Workshops	D.2.2. National guidelines and certification standards for solar-powered irrigation, incorporating water usage thresholds.	Month 5-6

Activity 2.3: Propose updates to incorporate agroforestry guidelines into relevant policies or standards. ■ 2.3.1. Existing Forestry/Agroforestry Policies ■ 2.3.2. Draft Amendments & Guidelines ■ 2.3.3. Submission & Advocacy	D.2.3. Recommendations for integrating agroforestry standards into policy frameworks.	Month 6-7
Activity B2: Working Group/coordination meeting	Deliverables D.B2. Working Group/coordination meeting report	Month 7

Output 3. Financing Structure and Digitalized Insurance Scheme

Activity 3	Deliverables D.3.1. D.3.2. D.3.3. D.B3.	Month 8-12
Activity 3.1: Engage financial institutions to design a blended finance facility for smallholders, leveraging public and private funding. ■ 3.1.1. Financial Landscape Analysis ■ 3.1.2. Blended Finance Model Design ■ 3.1.3. Term Sheets and Agreements ■ 3.1.4. Pilot Roll-Out Plan	D.3.1. Blended finance facility proposal (structure, term sheets, risk-sharing mechanisms).	Month 8-9
Activity 3.2: Assess and design a digitalized insurance product tailored for smallholder vegetable farmers, exploring AI, remote sensing, or picture-based approaches. ■ 3.2.1. Insurance Market Scan ■ 3.2.2. Digital Tool Feasibility ■ 3.2.3. Scheme Design Workshop ■ 3.2.4. Product Prototype & Business Model	D.3.2. Digital crop insurance product concept note with an operational roadmap (coverage, premium ranges, distribution).	Month 9-12
Activity 3.3: Identify partnership and risk-sharing structures (e.g. guarantee funds, reinsurance) to lower premiums and expand coverage. ■ 3.3.1. Stakeholder Engagement ■ 3.3.2. Risk Layering Approach ■ 3.3.3. Legal & Regulatory Alignment	D.3.3. Partnership & risk-mitigation framework (agreements, MOUs, or draft legal documents).	Month 10-12
Activity B3: Working Group/coordination meeting	Deliverables D.B3. Working Group/coordination meeting report	Month 12

Output 4. Capacity Building and Training

Activity 4	Deliverables D.4.1. D.4.2. D.4.3. D.4.4. D.B4.	Month 13-16
Activity 4.1: Develop training curricula on climate-resilient farming (irrigation, agroforestry, greenhouse management), digital tools, and insurance literacy. ■ 4.1.1. Curriculum Design ■ 4.1.2. Gender and Inclusion	D.4.1. Training materials and curricula (in Mongolian and English), including user manuals and guidelines.	Month 13
Activity 4.2: In-person workshop including “train-the-trainers” sessions in each pilot province. ■ 4.2.1. In-person workshop ■ 4.2.2. Knowledge Transfer ■ 4.2.3. Train-the-Trainers ■ 4.2.4. Insurance Literacy Sessions	D.4.2. Training workshops completed in each target province, with participant lists disaggregated by gender. D.4.3. Train-the-Trainers programme documented with follow-up plans.	Month 14-15
Activity 4.3: Establish or strengthen at least one centre of excellence/training hub per province. ■ 4.3.1. Institutional Arrangement ■ 4.3.2. Demonstration Sites ■ 4.3.3. Sustainability Strategy	D.4.4. Centres of excellence established or upgraded in Dundgovi and Uvurkhangai provinces. D.4.5: Final workshop report and in-person presentations.	Month 15-16
Activity B4: Working Group/coordination meeting	Deliverables D.B4. Working Group/coordination meeting report	Month 16

Output 5. Implementation Roadmap and Sustainability Financing Strategy, including two Scale-up Project Concept Notes

Activity 5	Deliverables D.5.1. D.5.2. D.5.3. D.C1. D.C2.	Month 17–18
Activity 5.1: Consolidate findings from all outputs to develop a multi-year implementation roadmap for scaling climate-resilient vegetable farming nationwide. ■ 5.1.1. Synthesis of Outputs ■ 5.1.2. Roadmap Drafting ■ 5.1.3. Cost Estimates & Resource Needs	D.5.1. Implementation roadmap document with short-, medium-, and long-term actions.	Month 17-18
Activity 5.2: Sustainable financing strategy, including two scale-up project concept notes. ■ 5.2.1. Institutional Roles ■ 5.2.2. Mechanisms for Scale-Up ■ 5.2.3. Scale-up Project Concept Notes ■ 5.2.4. Monitoring & Evaluation (M&E) Plan	D.5.2. Sustainable financing strategy, including two scale-up project concept notes with the package of supporting documents. D.5.3. Final report and in-person presentations. Final compiled deliverable, combining deliverables 1, 2, 3, 4 and 5 into a final report.	Month 17-18
Activity C.1: Post-implementation: Closure and Data Collection report	Deliverable D.C1. Closure and Data Collection report	Month 18
Activity C.2: Project-end communication and dissemination activities	Deliverable D.C2. Press release, webinar, dialogue with financial institutions	Month 18

Annex 2. Inception Workshop Report

The Inception Workshop was organized to inform stakeholders of the start of the project and ensure their active participation throughout the implementation process. The objectives were to:

1. Establish contact with stakeholders and determine contact persons from each entity, and
2. Confirm the outline of this technical assistance project including project outcome, outputs, activities, deliverables and time schedule.

Pre-workshop meetings and communications

A number of persons initially foreseen as participants in the Inception Workshop informed the team that they were not able to participate in the workshop in Ulaanbaatar, mainly due to the overlap between the workshop date and the sowing period. During this period, many officers and specialists of the Ministry of Food, Agriculture and Light Industry and provincial (aimag) Departments of Food and Agriculture, as well as farmer associations and international organisations, were working in the countryside, visiting crop and horticulture farms and providing technical advice.

Consequently, the following meetings and communications took place before the Inception workshop in order to inform and collect feedback on the project outcome, outputs, activities, deliverables and time schedule from those stakeholders that did not attend the workshop.

Table 4. Agenda of consultations ahead of the Inception Workshop

Date	Location	Activity	Stakeholders met
May 11, 2026	Uvurkhangai	Kick-off meeting	Mrs. Altantsetseg, Officer for crop production, Aimag Department of Food and Agriculture Mrs. Lkhagvajav, Head of the Inspection Division, State inspector for crop seed and quarantine control, Aimag Department of Food and Agriculture Mr. Ganbat, Governor of Arvaikheer soum Mr. Erdenebayar, Director of the Department of Environment
May 14, 2026	Dundgovi	Kick-off meeting	Mr. Munkhjargal, Director of the Aimag Department of Food and Agriculture Mrs. Erdenetungalag, Officer for crop production Mrs. Urtnasan, Head of the Inter-Soum Forestry Unit
May 17, 2026	Darkhan-Uul	Kick-off meeting	Mr. Yesun-Erdene, Director General, Department of Crop Policy Coordination and Implementation, Ministry of Food, Agriculture and Light Industry Mrs. Uranchimeg, Senior analyst, Department of Crop Policy Coordination and Implementation, Ministry of Food, Agriculture and Light Industry
May 18, 2026	Ulaanbaatar	Kick-off meeting	Mrs. Gantuya, General Manager of Business Development, Mongolian Re Mrs. Munkhbileg, Chief Underwriting Officer, Mongolian Re
May 18, 2026	Ulaanbaatar	Communication via Viber and phone	Mrs. Purevsuren, Head of the Green Finance Policy Division, Ministry of Economy and Development Mrs. Nandintsetseg, Head of the Innovation and Extension Division, Research and Development Center for Food, Agriculture and Light Industry Mrs. Nasanjargal, Dean of the School of Agroecology, Mongolian University of Life Sciences Mr. Batbold, President of the Mongolian National Crop Farmers' Association Mrs. Udval, Executive Director, Mongolian Vegetable Growers' Association Mrs. Burmaa, National project coordinator, FAO Mr. Firuz Saidkhadzhaev, Climate Finance and Development Economist, UNDP Mongolia
Total number			18 (12f/6m)

Workshop participants

Organisation	Name and position of participant
Ministry of Environment and Climate Change	■ Mrs. Narangaravuu Altangerel, Senior policy analyst, UNFCCC- and CTCN-Focal point ■ Mr. Tamir Enkh-Amgalan, Mongolian In-Country Facilitator of NDC-Partnership
Mongolian University of Life Sciences	■ Prof. Munkhbat Bazarjav, School of Engineering and Technology
Trade and Development Bank	■ Mrs. Indra, Relationship Manager of the Green Funding Office, Foreign Fund Management and Monitoring Unit, International Banking Department
Civil society organisations and NGOs	■ Mr. Tuvshintugs, World Vision Mongolia ■ Mr. Tegshbayar, Greenhouse expert, Greenhouse expert of the EU-funded "Ulaanbaatar Green Buildings" project, former advisor to CARITAS and GERES greenhouse projects
OIKO Experts team	■ Mr. Wilhelm Kruse, Team Leader ■ Mr. Arnaud Havet, Agroforestry expert ■ Mr. Roman Shynkarenko, Climate finance & insurance expert ■ Mr. Erdenebolor Baast, PhD, Policy & legislative expert ■ Mrs. Nyamgerel Bartseren, PhD, Irrigation & greenhouse expert
Total number	11 (3f/8m))

Recommendations resulting from the Inception workshop and the pre-workshop meetings

A. Recommendations regarding engagement with national-level stakeholders

- A formal Project Steering Committee is not considered necessary for this project due to its small scale; the establishment of an informal Working Group involving representatives of ministries (MECC, MOFALI, MED), government agencies, research and educational institutions, and the private sector should therefore be preferred.
- In general, the project should target a broad spectrum of stakeholders and seek strong collaboration with private sector partners such as banks, input suppliers and insurers;
- Ensure regular communication and coordination with the Ministry of Environment and Climate Change, represented through Mr. Tamir (NDC Partnership);
- Establish a close working relationship with MOFALI as the main source of technical inputs.
- Ensure close coordination between the national and international experts.

B. Recommendations regarding engagement with local-level stakeholders

- Explore opportunities to integrate the technical assistance into local-level and private-sector initiatives;
- Work closely with the Aimag Departments of Food and Agriculture of Uvurkhangai and Dundgovi as the primary local implementing partners, and designate a focal point in each aimag;

- Engage soum governors and local administrations at an early stage to facilitate access to land, identify suitable demonstration sites and ensure alignment with local development plans;
- Involve the Inter-Soum Forestry Units and the Aimag Departments of Environment in the design and siting of agroforestry, windbreak and water-related interventions.

C. Recommendations regarding project activities

- Ensure that recommendations resulting from the project match the demand of the target groups and are technically feasible and economically profitable;
- Present a clear plan for demonstrations and pilot activities at the local level (in Dundgovi and Uvurkhangai);
- Identify options for enhancing smallholders' access to green loans provided by the Trade and Development Bank and other banks.

D. Recommendations for creating synergies between the project and other initiatives

- Explore experience-sharing opportunities with similar initiatives such as the Smart Greenhouse project of MULS, the Vertical Farming project of MULS, and the World Vision pilot project for hydroponic system in Selenge aimag;
- Explore opportunities to integrate the technical assistance into programmes and initiatives funded by aimag and soum governments;
- Coordinate agroforestry pilots with the existing Green Belt initiative in Uvurkhangai aimag and ensure cross-learning with MOFALI's agroforestry pilot in Selenge aimag.

E. Recommendations regarding financial mechanisms and the crop-insurance product

- Design the digital crop-insurance product in close consultation with Mongolian Re and domestic insurers, drawing on the lessons of earlier index-based crop insurance pilots in Mongolia;
- Engage the Financial Regulatory Commission at an early stage regarding product approval, regulatory requirements and consumer protection;
- Coordinate with the Ministry of Economy and Development (Green Finance Policy Division) to align the insurance product and any blended-finance facility with the national green finance taxonomy and policy;
- Link insurance with access to green and subsidised loans (Trade and Development Bank and other banks) so that insured smallholders can more readily finance solar-powered irrigation and greenhouse investments;
- Draw on the experience and co-financing potential of development partners active in climate and agricultural finance, including UNDP and FAO, in designing and de-risking the financial instruments.

Meeting minutes

This annex summarises the minutes of the kick-off meetings and consultations held with stakeholders ahead of the Inception Workshop, and of the Inception Workshop itself. The participants, venues and dates correspond to those recorded in the tables above.

Kick-off meeting - Uvurkhangai aimag

Participants:

Mrs. Altantsetseg, Officer for crop production, Aimag Department of Food and Agriculture
Mrs. Lkhagvajav, Head of the Inspection Division, State inspector for crop seed and quarantine control, Aimag Department of Food and Agriculture
Mr. Ganbat, Governor of Arvaikheer soum
Mr. Erdenebayar, Director of the Department of Environment

Place: Uvurkhangai

Date: 11 May 2026

Matters discussed:

- The project objective, outputs and the four focal technologies (solar-powered irrigation, water pumping, greenhouse infrastructure and agroforestry/windbreaks) were presented. The Aimag Department of Food and Agriculture confirmed its interest and its readiness to act as the main local implementing partner and to nominate a focal point.
- Participants stressed that the solutions recommended by the project should match the demand of local vegetable producers and be technically feasible and economically profitable for smallholders.
- The Department of Environment highlighted opportunities to align agroforestry and windbreak activities with the existing Green Belt initiative in the aimag and to coordinate on the sustainable use of water resources.
- Participants requested a clear plan for demonstration and pilot activities and offered to assist in identifying candidate sites and farmers.

Kick-off meeting - Dundgovi aimag

Participants:

Mr. Munkhjargal, Director of the Aimag Department of Food and Agriculture

Mrs. Erdenetungalag, Officer for crop production

Mrs. Urtnasan, Head of the Inter-Soum Forestry Unit

Place: Dundgovi

Date: 14 May 2026

Matters discussed:

- The project was presented and the Aimag Department of Food and Agriculture confirmed its interest, its willingness to serve as the local partner and to nominate a focal point.
- Given the arid conditions of Dundgovi, participants emphasised water availability as the principal constraint and the importance of solar-powered water pumping, water-efficient (drip) irrigation and protective greenhouse infrastructure.
- The Inter-Soum Forestry Unit expressed its readiness to support the siting and design of agroforestry and windbreak interventions and to ensure cross-learning with national and local reforestation efforts.
- Participants requested clear demonstration and pilot plans and asked that the project's recommendations respond to local demand and be economically viable.

Kick-off meeting - Ministry of Food, Agriculture and Light Industry

Participants:

Mr. Yesun-Erdene, Director General, Department of Crop Policy Coordination and Implementation, Ministry of Food, Agriculture and Light Industry

Mrs. Uranchimeg, Senior analyst, Department of Crop Policy Coordination and Implementation, Ministry of Food, Agriculture and Light Industry

Place: Darkhan-Uul

Date: 17 May 2026

Matters discussed:

- MOFALI confirmed its role as the main source of technical inputs and policy coordination for the crop sector and expressed its support for the project.
- The Department noted the alignment of the project with national crop-sector priorities and ongoing programmes and suggested cross-learning with MOFALI's agroforestry pilot in Selenge aimag.

- The importance of close coordination between the national and international experts, and of integrating the project's recommendations into the Ministry's policy and programme instruments, was emphasised.
- The Department indicated its openness to sharing crop-sector data relevant to the feasibility study and to the design of the crop-insurance product, subject to agreement.

Kick-off meeting - Mongolian Re

Participants:

Mrs. Gantuya, General Manager of Business Development, Mongolian Re

Mrs. Munkhbileg, Chief Underwriting Officer, Mongolian Re

Place: Ulaanbaatar

Date: 18 May 2026

Matters discussed:

- The project's planned digital crop-insurance product was introduced and Mongolian Re expressed its willingness to engage in the design and testing of the product.
- The discussion covered the lessons of earlier index-based crop insurance pilots in Mongolia and the importance of reliable data and appropriate index design for crop and vegetable risks.
- The need for government support (for example, premium support) and for early coordination with the Financial Regulatory Commission on product approval was noted.
- Mongolian Re and the project agreed to maintain close coordination as the insurance product is developed.

Consultations by Viber and telephone

Participants:

Mrs. Purevsuren, Head of the Green Finance Policy Division, Ministry of Economy and Development
Mrs. Nandintsetseg, Head of the Innovation and Extension Division, Research and Development Center for Food, Agriculture and Light Industry

Mrs. Nasanjargal, Dean of the School of Agroecology, Mongolian University of Life Sciences

Mr. Batbold, President of the Mongolian National Crop Farmers' Association

Mrs. Udval, Executive Director, Mongolian Vegetable Growers' Association

Mrs. Burmaa, National project coordinator, FAO

Mr. Firuz Saidkhadzhaev, Climate Finance and Development Economist, UNDP Mongolia

Place: Ulaanbaatar (remote)

Date: 18 May 2026

Matters discussed:

- The Ministry of Economy and Development (Green Finance Policy Division) underlined the importance of aligning the insurance product and any blended-finance facility with the national green finance taxonomy and policy.
- The Research and Development Center (Innovation and Extension Division) and MULS (School of Agroecology) offered to support technical aspects, training and extension and to share experience from research and demonstration activities, including the Smart Greenhouse and Vertical Farming initiatives of MULS.
- The Crop Farmers' and Vegetable Growers' Associations stressed that the solutions must respond to growers' actual demand and improve access to finance, water and markets.
- FAO and UNDP expressed their interest in coordination and in potential synergies with their ongoing climate adaptation and agricultural finance work.
- All stakeholders supported a broad and inclusive engagement approach and willingness to engage in an informal Working Group.

Inception Workshop

Participants:

Mrs. Narangaravuu Altangerel, Senior policy analyst, UNFCCC- and CTCN-Focal point, Ministry of Environment and Climate Change

Mr. Tamir Enkh-Amgalan, Mongolian In-Country Facilitator of NDC-Partnership

Prof. Munkhbat Bazarjav, School of Engineering and Technology, Mongolian University of Life Sciences

Mrs. Indra, Relationship Manager of the Green Funding Office, Trade and Development Bank

Mr. Tuvshintugs, World Vision Mongolia

Mr. Tegshbayar, Greenhouse expert (EU-funded "Ulaanbaatar Green Buildings" project; former advisor to CARITAS and GERES greenhouse projects)

OIKO Experts team: Mr. Wilhelm Kruse (Team Leader), Mr. Arnaud Havet (Agroforestry expert), Mr. Roman Shynkarenko (Climate finance & insurance expert), Mr. Erdenebolor Baast (Policy & legislative expert) and Mrs. Nyamgerel Bartseren (Irrigation & greenhouse expert)

Place: Erdem Tower, Ulaanbaatar

Date: 19 May 2026

Matters discussed:

- The Team Leader of the OIKO team presented the project's objective, outcome, outputs, activities, deliverables and time schedule, together with the four focal technologies.
- Mrs. Narangaravuu from the Ministry of Environment and Climate Change (UNFCCC/CTCN focal point) stressed the alignment of the project with Mongolia's NDC and climate adaptation priorities and requested regular reporting to, and coordination with, MECC through Mr. Tamir (NDC Partnership In-Country Facilitator).
- Mrs. Narangaravuu also clarified that the project does not require a formal Steering Committee – and a Working Group involving a broad spectrum of stakeholders should be established instead.
- Mr. Tamir (NDC Partnership) recommended close collaboration with MOFALI as the main source of technical inputs, and requested a plan for pilot demonstration activities in the target aimags.
- The Trade and Development Bank provided an overview of its green funding instruments and discussed options for enhancing smallholders' access to green loans for solar-powered irrigation and greenhouse investments.
- MULS (School of Engineering and Technology) and the greenhouse expert offered technical advice and experience-sharing on greenhouse and renewable energy solutions, and World Vision shared the experience of its hydroponic pilot in Selenge aimag.
- Participants agreed that the project should pursue strong collaboration with the private sector and create synergies with related initiatives.

Pictures from the Inception Workshop: Mrs. Narangeravuu Altangerel, Mr. Tamir Enkh-Amgalan, Prof. Munkhbat Bazarjav, and the OIKO expert team: Mr. Wilhelm Kruse (Team Leader), Mr. Arnaud Havet (Agroforestry Expert), Mr. Roman Shynkarenko (Climate Finance and Insurance Expert), Mr. Erdenebolor Baast (Policy and Legislative Expert), and Mrs. Nyamgerel Bartseren (Irrigation and Greenhouse Expert).



Annex 3. Proposed members of the Working Group

In line with the recommendations above, an informal Working Group is proposed in place of a formal Project Steering Committee. The proposed composition below brings together the ministries, government agencies, provincial and local authorities, research and educational institutions, private sector partners, farmer associations, civil society organisations and development partners consulted during the inception phase. The list is indicative and may be adjusted as the project progresses.

Sector / Institution	Proposed member(s) and position
Government ministries and agencies	
Ministry of Environment and Climate Change (MECC)	Mrs. Narangaravuu Altangerel, Senior policy analyst, UNFCCC- and CTCN-Focal point; Mr. Tamir Enkh-Amgalan, In-Country Facilitator of NDC-Partnership
Ministry of Food, Agriculture and Light Industry (MOFALI)	Mr. Yesun-Erdene, Director General, Department of Crop Policy Coordination and Implementation; Mrs. Uranchimeg, Senior analyst
Ministry of Economy and Development (MED)	Mrs. Purevsuren, Head of the Green Finance Policy Division
Research and Development Center for Food, Agriculture and Light Industry	Mrs. Nandintsetseg, Head of the Innovation and Extension Division
Provincial and local government	
Uvurkhangai Aimag Department of Food and Agriculture	Mrs. Altantsetseg, Officer for crop production (focal point)
Uvurkhangai Aimag Department of Environment	Mr. Erdenebayar, Director
Dundgovi Aimag Department of Food and Agriculture	Mr. Munkhjargal, Director
Dundgovi Aimag Department of Food and Agriculture	Mrs. Erdenetungalag, Officer for crop production (focal point)
Dundgovi Inter-Soum Forestry Unit	Mrs. Urtnasan, Head
Research and education	
Mongolian University of Life Sciences (MULS)	Prof. Munkhbat Bazarjav, School of Engineering and Technology; Mrs. Nasanjargal, Dean of the School of Agroecology
Private sector	
Mongolian Re	Mr. Batbayar, Mrs. Gantuya, General Manager of Business Development / Mrs. Munkhbileg, Chief Underwriting Officer
Trade and Development Bank	Mrs. Indra, Relationship Manager, Green Funding Office
Green Finance Corporation of Mongolia	Mr. Bold, CEO
Tarimal Urgamal LLC (input supplier)	Mrs. Khandsuren, CEO
Farmer associations	
Mongolian National Crop Farmers' Association	Mr. Batbold, President
Mongolian Vegetable Growers' Association	Mrs. Udval, Executive Director
Civil society	
World Vision Mongolia	Mr. Tuvshintugs
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Project team	
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