



Technology Executive Committee

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Draft outline for a toolkit guide for scaling up climate technology solutions in resilient agrifood systems

Background note

A. Background

1. The Technology Executive Committee (TEC), in collaboration with the Food and Agriculture Organization of the United Nations (FAO), launched in 2024 the publication *Climate Technologies for Agrifood Systems Transformation*¹, which consolidated evidence on the role of climate technologies in supporting agrifood systems transformation, with particular emphasis on adaptation, resilience and enabling conditions across agrifood value chains.
2. The publication identified persistent barriers to the development, transfer and uptake of climate technologies in agrifood systems, including constraints related to access to finance, institutional and technical capacity, and the limited availability of operational guidance to translate high-level policy priorities into implementable pathways.
3. At TEC 31, the TEC agreed to develop, in collaboration with FAO, a practical toolkit by 2027 to enhance technology development and transfer in agrifood systems, address identified barriers, and strengthen the availability and application of evidence-based solutions relevant to agrifood systems and climate-resilient development.
4. In response, the open-ended activity group, in collaboration with FAO, has prepared a draft outline of the proposed toolkit entitled: “Resilient Roots: A Toolkit Guide for Scaling Up Climate Technology Solutions in Agrifood Systems.”
5. The proposed guidebook aims to support countries and relevant stakeholders in translating identified climate technology needs in agrifood systems into structured, actionable and investment-oriented pathways.
6. While national and international frameworks, including NDCs, NAPs, LT-LEDS and technology needs assessments, identify priorities for climate action, further operational guidance is often required to link technology selection with value chain dynamics, enabling conditions and financing strategies in agrifood systems.
7. The toolkit seeks to address this gap by:
 - (a) Applying a value-chain-based and context-specific approach to the identification and prioritization of climate technologies;
 - (b) Linking technology options to investment planning and financing instruments;
 - (c) Addressing enabling conditions, including institutional coordination, market readiness and innovation systems;

¹ Available at: <https://unfccc.int/ttclear/tec/water-energy-food.html#agrifood>.

(d) Integrating inclusive approaches, including gender-responsive and locally grounded solutions;

(e) Supporting coherence between climate objectives and agrifood systems transformation strategies.

8. The toolkit is intended for policymakers, National Designated Entities, technical institutions, farmers' organizations, project developers and investors.

B. Scope of the note

9. The annex to this note contains the draft outline of the toolkit.

10. The draft outline proposes a sequenced framework covering:

(a) Contextual analysis of agrifood systems, climate risks and policy landscapes;

(b) Identification and prioritization of value chains and climate technology interventions;

(c) Market and stakeholder analysis to assess technology uptake and barriers;

(d) Translation of technology priorities into investment envelopes and financing pipelines;

(e) Compilation of reference materials and tools to support implementation.

11. The toolkit is not intended to replace or duplicate national assessments. Rather, it provides a structured methodological framework that builds on existing analyses and supports implementation and scaling of climate technologies across agrifood value chains.

C. Possible actions by the Technology Executive Committee

12. The TEC will be invited to consider the draft annotated outline and provide guidance to its open-ended activity group to further develop the guidebook, and consider the following guiding questions:

(a) Strategic framing and scope: Are there relevant recent decisions or processes that should be more explicitly reflected?

(b) Operational clarity and value added: Are there steps that would benefit from further clarification, simplification or consolidation?

(c) Financing and enabling conditions: Does the investment-readiness framing adequately respond to barriers identified in prior TEC work?

(d) Cross-cutting considerations: Are gender, youth, Indigenous Peoples' knowledge and other equity considerations appropriately reflected at this stage?

13. In addition, the TEC is invited to provide strategic guidance to inform further development of the toolkit, as follows:

(a) Share relevant tools, methodologies, case studies or reference documents that could be considered for inclusion in the annexes (e.g. value chain analysis tools, climate technology assessment methodologies, financing frameworks, gender-responsive approaches);

(b) Identify up to two countries that may be willing to review the toolkit more closely and provide feedback on its practical relevance and value added.

Annex

Draft Outline for “A Toolkit Guide for Scaling Up Climate Technology Solutions in Agrifood Systems”

I. “Why this Toolkit?” - Executive snapshot

1. This toolkit responds to the growing urgency to accelerate climate technology uptake and investment in agrifood systems, particularly in developing and climate-vulnerable countries. While global climate frameworks increasingly recognize the importance of technology transfer and innovation, agrifood systems continue to face structural, financial, and contextual barriers that hinder the scaling-up of climate technologies.
2. The toolkit is designed for a broad range of users, including policymakers, National Designated Entities (NDEs), technical institutions, farmers’ organizations, project developers, and investors. Its distinctive contribution lies in its value-chain-based and context-specific approach, which links climate risks, agrifood system dynamics, technology choices, and investment planning in a coherent process.
3. The toolkit is closely aligned with national and international climate and agrifood policy frameworks, including Nationally Determined Contributions (NDCs), National Adaptation Plans (NAPs), Long-Term Low-Emission Development Strategies (LT-LEDS), and agrifood sector policies. It reflects evolving priorities under the UNFCCC related to agriculture, food security, and resilience, and supports countries in strengthening coherence between climate objectives and agrifood system development goals.
4. Rather than providing a comprehensive national assessment, the toolkit illustrates the structure, sequencing, and requirements of a planning process. It builds on existing national analyses and policy documents and shows how they can be translated into actionable pathways for climate technology uptake across national and subnational agrifood contexts.

II. Introduction, purpose, and strategic framing [3 pages]

A. Introduction

5. Agrifood systems are central to livelihoods, food security, and economic development, while also being highly exposed to climate change. Increasing climate variability, extreme weather events, and long-term shifts in temperature and precipitation patterns threaten agricultural productivity, supply chains, and rural incomes.
6. This section introduces the relevance of Article 10 of the Paris Agreement and the UNFCCC Technology Mechanism, highlighting their role in promoting technology development and transfer. It also situates agrifood systems within the outcomes of the Global Stocktake (GST), emphasizing the identified need to accelerate climate action and technology deployment in the agrifood sector.
7. Recent UNFCCC decisions, including those emerging from Sharm El-Sheikh and subsequent negotiations, are discussed to show how agrifood systems have gained prominence within the climate agenda, particularly in relation to adaptation, food security, and implementation support.

B. Objectives and focus

1. Objective

8. Building on the progress achieved through the UNFCCC Technology Mechanism, the recommendations from its first periodic assessment, the call for action emerging from the first Global Stocktake, and the aims of the Poznan Strategic Programme on Technology Transfer, this toolkit supports the implementation of climate action within the specific context of agrifood systems. While these global frameworks establish important goals for technology development and transfer, capacity-building, and financing, they remain largely high-level and offer limited operational guidance tailored to the distinct characteristics and needs of agrifood systems.

9. This toolkit addresses that gap by contextualizing climate technologies within agrifood systems and value chains and by linking technology interventions to concrete investment opportunities and financing mechanisms. By aligning climate and technology needs with specific agrifood contexts, the toolkit seeks to translate global technology and finance ambitions into actionable pathways that can accelerate sustainable and resilient agrifood system transitions at scale.

2. Focus

10. The toolkit focuses on climate technologies that support the resilience and transformation of agrifood systems. Interventions are contextualized within national and subnational settings and analysed through a value chain lens. A clearly defined agrifood system and value chain framework is used to assess the viability of climate technologies and to identify the investment requirements necessary for their implementation and scaling.

11. Target users include policymakers, NDEs, technical institutions, farmers and cooperatives, investors, and project developers.

C. Expected outcomes

12. The toolkit is designed to generate practical outputs, including value chain intervention maps, context-specific technology priorities, investment envelopes and financing pipelines, and strengthened institutional alignment.

1. The context for the investments: agrifood systems, climate change and sector policies [5 pages]

13. This chapter sets out the contextual analysis. It examines the agrifood system context, climate risks and vulnerabilities, and the relevant policy and institutional landscape to ensure that subsequent value chain and investment analyses are grounded in national priorities and local realities.

Step I: Agrifood system context

14. This step provides an overview of the national context, with a focus on the role of agriculture in the economy and food security. It includes a high-level screening of the agrifood system to identify key sectors such as crops, livestock, forestry and fisheries.

15. Priority agricultural products and subsectors are identified based on criteria such as economic importance and relevance to food security.

Step II: Climate impacts and vulnerability

16. This step identifies and characterizes the main climate hazards affecting the agrifood system, such as droughts, floods, heat stress, and changing rainfall patterns. It examines how different components of the agrifood system are exposed and vulnerable to these hazards, highlighting where climate risks are most acute and where climate technologies can deliver the greatest resilience benefits.

Step III: Policy and institutional landscape

17. This step reviews existing agricultural and climate policy frameworks, including those that reference or promote climate technologies, and assesses institutional coordination mechanisms and governance arrangements relevant to agrifood system transformation.

18. The analysis also examines national systems of innovation and the integration of emerging technologies, with attention to the roles of research institutions, think tanks, private sector actors, and non-governmental organizations. Particular emphasis is placed on capacity-building, knowledge dissemination, and the inclusion of local knowledge-sharing networks and indigenous technologies.

2. Identifying and selecting priority intervention areas [5 pages]

19. This chapter outlines a structured approach to identifying and prioritizing technology interventions in agrifood systems. It integrates decision-support tools, suggested data sources, and expected outputs throughout the analysis to guide users through the technology selection process.

Step I: Value chain identification

20. Priority agrifood sectors and value chains are selected using predefined criteria such as economic relevance, employment potential, export opportunities, climate vulnerability and contribution to food security. This selection process ensures that subsequent interventions focus on value chains with high impact potential.

Step II: Agrifood systems interventions and value chain mapping

21. Selected value chains are mapped from production to consumption, identifying key actors, processes, climate impacts, and existing technology use, including indigenous and local technology options. Social and gender-specific roles are explicitly considered to ensure inclusivity.

22. This step also identifies critical points along the value chain and potential intervention opportunities, such as inefficient water use or post-harvest losses.

Step III: Market analysis

23. Market opportunities for priority products are assessed, including demand trends, pricing, and competitiveness. The analysis identifies opportunities for value addition and improved market access that can enhance the financial viability of climate technology investments.

Step IV: Stakeholder analysis and technology uptake

24. Key stakeholders along the value chain are identified and categorized according to their roles in policymaking, implementation, financing, and end use. Current levels of technology adoption and readiness are assessed, together with barriers to uptake.

25. Social, gender and technology justice considerations are integrated throughout the analysis to ensure that interventions promote equitable access to technologies, inclusive participation, and fair distribution of associated benefits.

Step V: Selection of climate technology options

26. Based on the preceding analyses, priority climate technology options are identified and selected. These technologies are aligned with national climate and agricultural strategies and assessed for their potential to mobilize sustainable investment and deliver resilience outcomes.

3. Financing climate technology interventions [5 pages]

27. This section translates prioritized value chains and selected climate technologies into concrete investment planning outputs. It estimates investment volumes by technology type and by value chain intervention point - from production and storage to processing and distribution.

28. Building on these estimates, the chapter guides users in mapping financing requirements and assessing investment readiness. An investment readiness lens is applied to evaluate key enabling conditions, including regulatory frameworks, institutional capacity, and market viability.

29. The toolkit also supports the identification of appropriate financing instruments and sources aligned with the characteristics of each intervention. The objective is to structure coherent investment envelopes and develop financing pipelines capable of mobilizing public and private investment.

4. Conclusions [1 page]

30. The concluding section summarizes the toolkit's contribution to accelerating climate technology uptake in agrifood systems. It provides guidance on how to integrate the results into national and subnational plans and programmes.

III. Annexes: Reference documentation and tools

31. The annexes compile reference materials, tools, and case studies to support implementation. These include resources on climate technology options, value chain analysis, project feasibility assessment, and gender and youth inclusion.
