



Technology Executive Committee

07 March 2023

Twenty-sixth meeting

21–23 March and 24 March 2023 (TEC-CTCN Joint session)

Thematic dialogue on the water-energy-food nexus

Concept note

I. Background

1. At TEC 24, the TEC initiated the preparation of a new rolling workplan for 2023–2027 and agreed to invite inputs from observer Parties and organizations to inform and support the elaboration of its new rolling workplan. In this context, the FAO’s Office of Climate Change, Biodiversity and Environment made a submission¹ with a proposed list of activities related to agri-food systems, noting that at FAO, “scaling up technology and innovation” are viewed as priorities contributing to increase food security, protection of biodiversity, restoration of ecosystems and tackling climate change.

2. At TEC25, the TEC agreed on its rolling workplan for 2023–2027, as part of the first joint work programme of the Technology Mechanism.² Under this workplan, the TEC identified the “water-energy-food systems” as one of the key activities under Workstream 3: Transformative and innovative solutions. Given the unique expertise of FAO on the topic, the expressed interest through bilateral engagements (including at the SB56) and their contributions to the development of this activity, the TEC agreed to undertake the work under Activity C.1.1 in close collaboration with FAO.

3. As per activity C.1.1 of the TEC rolling workplan for 2023–2027, the TEC is to organize a thematic dialogue on the water-energy-food nexus in 2023, followed by a related knowledge product and event, to be delivered in 2024.

4. Since the launch of its rolling workplan for 2023–2027, the TEC with support from the secretariat has engaged with FAO, including at COP27, with a view to advance work under this activity. Consequently, a draft concept note for the thematic dialogue (referred to in paragraph 3) is developed.

II. Scope of the note

5. The annex to this note is prepared to inform the discussions of the TEC with regards to the organization of the thematic dialogue on the water-energy-food nexus, in collaboration with FAO, to be held at the 58th session of the subsidiary bodies in June 2023 (SB 58).

III. Expected action by the Technology Executive Committee

6. The TEC will be invited to consider the draft concept note and provide guidance on further work on this matter, including on the:

- (a) Objective;

¹ See stakeholder submissions:

https://unfccc.int/ttclear/misc_/StaticFiles/gnwoerk_static/TEC_documents/88dba8f79c234bbba96084322c3f0bf4/3dc400123716424ea1642d3cbac6a30f.pdf.

² [Joint Work Programme of the UNFCCC Technology Mechanism for 2023–2027](#).

(b) Suggested topics and sub-topics for discussions;

(c) Potential speakers.

7. In addition, the TEC may wish to consider future activities, related to this topic that it may wish to organize at COP 28.

Annex

Draft Programme

TEC in collaboration with FAO organizes the Thematic Dialogue: Accelerating climate innovation and technology in the water-food-energy systems for inclusive NDC and NAP implementation

I. Mandate

1. This thematic dialogue (TD) is linked to activity C.1.1 on “Water-Energy-Food Systems” of the TEC’s [2023–2027 workplan](#). The TD will be organized as an in-person, in-session event during the 58th session of the subsidiary bodies (SB58) in Bonn. The dialogue will focus on innovative technology practices and solutions related to food-water-energy systems to support countries in the implementation of their NDCs in these sectors, to build inclusive agri-food systems and achieve food security.

II. Objectives

2. The aim of this dialogue is to bring relevant stakeholders together to discuss innovative technology practices and solutions related to water-energy-food systems. In particular, the dialogue aims to:

(a) Shed light on relevant adaptation technologies (i.e. indigenous, innovative and digital technologies), with a view to strengthen adaptation planning (NAPs) and NDC ambitions in agrifood systems;

(b) Inform the future work of the TEC on the topic, including with regard to scoping possible thematic focus in the development of a knowledge product in 2024.

3. This TD will contribute to better understanding the options, ways and barriers to achieving progress under SDG 2 and the goals under the Paris Agreement.

III. Provisional agenda (3 hours session)

Moderator - Dr. Zitouni Ould-Dada, Deputy Director, Office of Climate Change, Biodiversity and Environment, FAO.

Time	Agenda item	Potential Speakers [TBC]
15 min	Opening remarks by high level officials	UNFCCC, TEC Chairs, FAO
15 min	Keynote speech on “The role of innovation and technology in improving food security and promoting integrated solutions in Water-Food-Energy systems for implementation of NDCs and NAPs”	
15 min	Voices from Indigenous Peoples and Youth “Technologies and innovation for inclusive transformation of agrifood systems – good examples from Indigenous peoples’ knowledge, local practices, and youth-led solutions”	
Session 1: Identifying transformative climate innovations and adaptation technologies in the water-energy-food nexus with strong mitigation and SDG co-benefits		
30 min	Expert panel on various transformative adaptation technologies with strong mitigation and SDG co-benefits (3-4 people) that can cover collectively the following issues: <ul style="list-style-type: none"> Innovation and technologies for better food security, nutrition and healthy diets; 	

Time	Agenda item	Potential Speakers [TBC]
	<ul style="list-style-type: none"> • Biotechnologies for conservation agriculture and land-use planning (e.g. genetically improved crop varieties); • Technologies to improve energy efficiency (e.g. through using solar pumps and wind power) and water efficiency (e.g. efficient irrigation technologies, rainwater harvesting); • Technologies for soil management and recovery; • Technologies for addressing climate change related hazards, such as early warning systems; • Digital agriculture technologies; • Indigenous peoples' knowledge and local practices; • Gender mainstreaming and youth-led solutions. <p>Interaction with participants</p>	
Session 2: Accelerating the implementation and scaling up of technology solutions and innovation in water-energy-food systems		
30 min	<p>Expert panel on different technology enablers to scale up implementation in the water-energy-food nexus:</p> <ul style="list-style-type: none"> • 1 speaker on capacity and institutional enablers, e.g. institutional arrangements at the national and sectoral levels; institutional capacities for coherence and coordination of planning, policy, and action; • 1 speaker on financial enablers, e.g. innovative financing, accelerating access to support, enhancing ambition for climate finance, tapping into the potentials for private and alternative sources of financing; • 1 speaker on policy enablers, e.g. policy integration and coherence, policy innovations to maximize synergies and minimize trade-offs. <p>Interaction with participants</p>	
Break		
Session 3: Inclusive transformation in water-energy-food systems in the implementation of NDCs and NAPs		
40 min	<p>4 Breakout groups/World Café <i>Thematic topic(s) and guiding questions to be determined, including discussion on what topic the TEC should focus on the knowledge product to be developed in 2024</i></p>	
Report back and Closing		
15 min	Summary points by facilitators (3 min x 4 groups)	
5 min	Take away messages & Closing	

IV. Background

4. This TD will build on the previous work by TEC on climate-smart agriculture. It will explore the options and barriers to fostering innovation and technology development and transfer in agri-food systems including through integrating relevant considerations and measures into the planning and implementation processes of nationally determined contributions (NDCs) and national adaptation plans (NAPs).

5. In the TEC rolling workplan for 2023–2027, which is part of the joint work programme of the Technology Mechanism, the committee has identified the work on Water-Energy-Food nexus as a key activity under the ‘transformative and innovative solutions’ workstream. The FAO’s office of Climate Change, Biodiversity and Environment, building on their rich experience and unique expertise in the agri-food systems, has contributed to the development of this activity through their submission to the TEC call for inputs for the preparation of its new rolling workplan,¹ as well as bilateral engagements with the TEC at SB56 and COP27, in pursuit of closer engagement and

¹ See stakeholder submissions:

https://unfccc.int/tclear/misc/_StaticFiles/gnwoerk_static/TEC_documents/88dba8f79c234bbba96084322c3f0bf4/3dc400123716424ea1642d3cbac6a30f.pdf.

collaboration. The TEC has welcomed the interest and contributions of the FAO and agreed to undertake this activity (C.1.1) in close collaboration with FAO.

V. Context

6. Agricultural sectors are responsible for about 13–21% of global total anthropogenic greenhouse gas (GHG) (IPCC, 2022), but they are also a key part of the climate solution to achieve the goals of the Paris Agreement and SDGs. According to the FAO's analysis, around 90 percent of the countries' NDCs refer to the agriculture sectors (FAO 2021),² indicating the important role of agricultural sectors in the implementation of climate agendas.

7. Findings from the latest (fourth) synthesis report of technology needs,³ published by the UNFCCC, emphasizes the significance of energy, agriculture, and water sectors in achieving the climate goals of countries. For mitigation, almost all of the reviewed reports in this study (53 non-Annex I parties) prioritized the energy sector. For adaptation, agriculture and water were the most prioritized sectors.

8. Addressing the water-energy-food nexus through technology-based solutions in the context of climate change is key for achieving the long-term temperature goal of the Paris Agreement and SDG2 on Zero Hunger. The Sharm-el-Sheikh Implementation Plan (decision 1/CP.27)⁴ highlights the importance of cooperation on technology development and transfer and innovation in implementing the joint work programme activities.

9. Water, energy and food are essential for human well-being, poverty reduction and sustainable development. Global projections indicate that demand for freshwater, energy and food will increase significantly over the next decades under the pressure of population growth and mobility, economic development, international trade, urbanization, diversifying diets, cultural and technological changes, and climate change (FAO, 2014).⁵

10. Limited or inadequate access to energy along the agri-food chains has negative impacts, including increased food loss, limited capacity to produce higher value products and limitations in the ability of farmers to increase incomes and improve livelihoods. Reducing energy-related emissions from agri-food chains requires the promotion and scaling up of renewable energy technologies and improvement of energy efficiency. Furthermore, this allows to reduce food losses caused by improper storage and handling, reduce deforestation by providing sustainable alternatives to using wood fuels for cooking and an overall increase in rural incomes and agricultural productivity.

11. In particular, water-food-energy nexus presents opportunities for achieving the climate goals. Agriculture accounts for 72 percent of freshwater withdrawals so action and investment are needed to produce more with less water and support adaptation to climate change. Water is used for agricultural production, forestry and fishery, along the entire agri-food supply chain, and it is used to produce or transport energy in different forms.

12. At the same time, the food production and supply chain consumes about 30% of total energy consumed globally. Energy is required to produce, transport and distribute food as well as to extract, pump, lift, collect, transport and treat water. Cities, industry and other users, too, claim increasingly more water, energy and land resources, and at the same time, face problems of environmental degradation and in some cases, resources scarcity.

13. Various adaptation measures built upon improved land and water management practices conservation and its efficient use have the potential to create resilience to climate change and to enhance water- energy- and food security. In order to meet the challenge of food security, there is a need to understand the need of efficient use of water and energy.

² <https://www.fao.org/3/cb7442en/cb7442en.pdf>

³ https://unfccc.int/sites/default/files/resource/sbi2020_inf.01.pdf.

⁴ https://unfccc.int/sites/default/files/resource/cop27_auv_2_cover%20decision.pdf.

⁵ FAO, 2014. The Water-Energy-Food Nexus. Available at: <https://www.fao.org/3/bl496e/bl496e.pdf>.