2024 Annual Operating Plan Report

Contents

Abbreviations and Acronyms

AF…… Adaptation Fund

AFCIA…… Adaptation Fund Climate Innovation Accelerator

AI…….. artificial intelligence

COP……... Conference of the Parties

CTCN……... Climate Technology Centre and Network

FAO…… Food and Agriculture Organization of the United Nations

GCF……... Green Climate Fund

GCNMA……... Glasgow Committee on Non-market Approaches

GEF……. Global Environment Facility

GHG…….. greenhouse gas

LDC……. least developed country

NAP……. national adaptation plan

NDC……... nationally determined contribution

NDE……. national designated entity

NGO…… non-governmental organization

Pro-Bono J…… Pro bono publico received from Japan

Prob-Bono K……. Pro bono publico received from Republic of Korea

SB…….. sessions of the subsidiary bodies

SBI…….. Subsidiary Body for Implementation

SIDS…….. small island developing State(s)

TA…….. technical assistance

TAP…… technology action plan

TEC……. Technology Executive Committee

TNA…… technology needs assessment

UNEP……... United Nations Environment Programme

WIPO…… World Intellectual Property Organization

I. Introduction

2024 marked ten years since the inception of the CTCN on 19 April 2014 and the second year of implementation of the CTCN's third Programme of Work (PoW) for the period 2023 - 2027[1]. During its decade of action, the CTCN has positioned itself as the upstream provider of small-scale technical assistance programmes which can prepare the groundwork for large-scale programmes. Since its inception, the CTCN has evolved to remain highly relevant in implementing the Technology Mechanism. Not only has the Technology Mechanism Joint Work Programme ensured an unprecedented level of cooperation and collaboration within the Technology Mechanism, but on top of this the introduction of the five system transformation areas, the Water-Energy-Food nexus, Buildings and Infrastructure, Sustainable Mobility, Energy Systems, and Business and Industry, and its two enablers - National Systems of Innovation and Digitalization - ensures that the third PoW of the CTCN continues to effectively deliver on the CTCN's mandate to respond to country-driven requests.

Several new processes, approved by the CTCN Advisory Board, have been introduced to ensure that technical assistance reaches the regions and communities most in need. The Prioritization Criteria emphasize support for Least Developed Countries (LDCs) and Small Island Developing States (SIDS), as well as countries that have not received technical assistance in the past five years[2]. Additionally, endorsed annual gender work plans with increased budgets are being implemented to better address the needs of the most vulnerable and marginalized populations. To enhance NDE engagement and project ownership, a post-implementation follow-up process will be piloted in 2025. This initiative aims to involve NDEs in project follow-ups, providing a clearer understanding of project outcomes and their impact.

Moreover, the Advisory Board also approved provision of logistical support to NDEs[3]. The support can be used to facilitate NDEs engagements with national actors to identify prioritized technology interventions needed by the country, assist with the monitoring of the project after delivery of technical assistance, or engage key stakeholders to mobilize support for scaling up the projects.

At COP29, the Green Climate Fund (GCF) ushered in a new era of collaboration with the CTCN by approving $540,000 in Project Preparation Facility (PPF) funding for a transformative initiative by Kenya Commercial Bank (KCB). Developed with initial support from the CTCN and its network member, this project represents a significant step toward sustainable financing. The full-scale project, valued at $218 million, is set to be submitted to the GCF in 2025.

At its 24th meeting, held in Bonn from 20 to 25 September 2024, the Advisory Board endorsed and welcomed its new Secretary and Director of the CTCN, Ariesta Ningrum, and thanked outgoing acting Director, Rajiv Garg, for his services.

The 2024 Annual Operating Plan report presents the CTCN's activities conducted between January and December 2024, following the endorsed activities and budget for 2024 set by the CTCN Advisory Board. It is structured around the five themes of the Technology Framework (Innovation, Implementation, Enabling environment and capacity building, Collaboration and stakeholder engagement, and Support) while also incorporating the two enablers and five key system transformation areas outlined in the third Programme of Work.

[1] https://www.ctc-n.org/resources/ctcn-third-programme-work-2023-2027

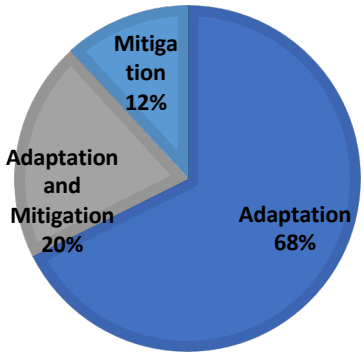
[2] At its 23rd meeting in April 2024, the Advisory Board endorsed the updated Prioritization criteria for technical assistance requests, to guide which technical assistance requests submitted by NDE shall be prioritized. Internal guidance on the application of the criteria has been developed and is now being implemented. AB-2024-23-21_Approved_Prioritization Criteria for Technical Assistance.pdf

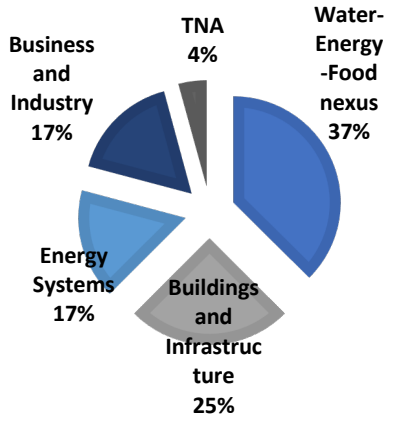
[3] AB-2024-23-20.1_Template for requesting logistic support for NDEs.pdf

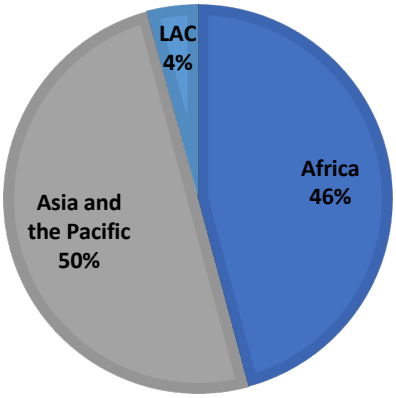
II. CTCN in 2024 by Numbers

105 Technical Assistance interventions at various stages of implementation[4]

24 Technical Assistance interventions completed in 2024.[5]







6 AFCIA[1] TAs completed

3 GCF readiness projects completed

3 Pro-bono TAs completed: 2 by RoK, 1 by Japan

21 policies, strategies, plans, laws, agreements, or regulations supported by the CTCN technical assistance

---

15 Global and Regional Capacity Building Programmes organized by the CTCN in 2024

---

59 new network members have joined the CTCN in 2024, bringing the total number of members to **894**

[4] Including review, design/new request stage (includes bidding stage), implementation stage, and completion stage
[5] A full list of donors to the CTCN's Third PoW can be found in the 2024 financial report

III. Innovation

CTCN Technical Assistance projects centered on the theme of innovation.

The Adaptation Fund Climate Innovation Accelerator (AFCIA)

Since 2020, CTCN has been implementing projects under the first edition of the Adaptation Fund Climate Innovation Accelerator (AFCIA) [6] to foster innovation in adaptation in developing countries. As part of this programme, the CTCN has received over 500 requests on innovative adaptation technologies from more than 105 countries. 25 out of these 500 requests were selected for CTCN technical assistances and are at different stages of implementation, 6 of which have been completed in 2024.
Furthermore, two concept notes were developed for submission to the Adaptation Fund Innovation Facility for scaling up successful initiatives. These concept notes are valued at 5 million USD upon full project implementation. The concept note for Burundi was approved by the Adaptation Fund in April 2024 and is currently under Full proposal formulation by UNEP with the support of CTCN.

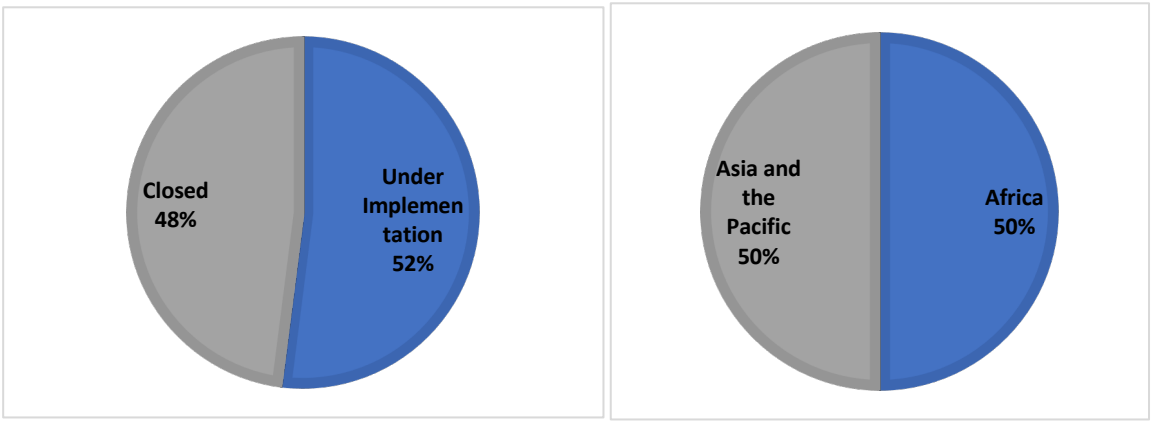
Since its inception in 2023, AFCIA I successfully reported to key stakeholders on the 25 requests selected for CTCN technical assistances, through a project dashboard[7] with continuously updated project information as well as 25 fact sheets that describe the impact and beneficiaries of the pilots. These were promoted on social media as well as to the countries.

Building on the success of AFCIA I, a second phase of the programme was launched. The CTCN has administered USD 10 million for this 2nd phase since July 2024, which is expected to fund 60 TA projects over five years.

Additionally, the Adaptation Fund, at its 43rd Board meeting from 10-11 October 2024 selected UNEP-CTCN to oversee the coordination of AFCIA grants over the next three years, with a budget of 2.7 million USD.

[6] The first edition of the AFCIA had a USD 10 million small-grant aggregator programme implemented by the United Nations Development Programme (UNDP) and UNEP in conjunction with CTCN.
[7] https://www.ctc-n.org/technical-assistance/adaptation-fund-climate-innovation-accelerator-afcia

AFCIA Implementation Dashboard (as of 1 March. 2025)[8]:



AFCIA projects completed in 2024:

Ghana	Promoting and upscaling appropriate solar irrigation technology options for smallholder farmers in Ghana through innovative climate adaptation financing mechanisms, a conducive policy framework for technology regulation and tailored training modules
Maldives	Establishment of a skimming well gallery system for agricultural use in HDh. Nolhivaranfaru of Maldives
Nepal	Customized weather and climate information system for climate-resilient agriculture in Nepal
Pakistan	Improving adaptive capacities of water sector through surface rainwater harvesting technology adoption
Sudan	Strengthening the community-based flood and drought preparedness and early warning system in Sudan using operational and innovative models in addition to Satellite-based transmission technology for real-time automatic water level telemetry system
Sudan	Soil erosion valuation to support climate resilient agriculture and food security
Concept Note Submissions to the Adaptation Fund:	
Burundi	Easily deployable water-filled flood barrier that can be used to prevent damage from flooding and to store water vapor-tight to ensure water availability in times of drought. The Concept Note was approved by the AF and a Full Proposal is being formulated.
Maldives	Establishment of a skimming well gallery system for agricultural use in HDh. Nolhivaranfaru of Maldives. The Concept Note was formulated and is currently being revised by CTCN Secretariat.

[8] https://www.ctc-n.org/sites/default/files/resources/CTCN_AFCIADashboard_Final.pdf

EU-funded programmes

The EU and its Member States remain the largest donor to the CTCN. The European Commission is currently funding two programmes implemented by the CTCN with a total of 17 technical assistance projects:

1. **The Climate Change and Security: Climate Technology for Communities at Risk of Climate-induced Conflicts Programme**

The programme with a total budget in the amount of USD 3.28 million continued being implemented through ten technical assistance projects in Burkina Faso, Central African Republic, Cameroon, Chad, Colombia, Mali, Nigeria, Sudan, Zimbabwe and Haiti.[9]

To ensure visibility for this programme, a number of communications campaigns are planned. For example, 10 fact sheets are set for publication in 2025 along with 10 human-centric videos and web stories to describe the impact and beneficiaries of each project, with an official event planned at COP30, where the Impact Report will be presented to showcase the programme along a photo exhibit.

2. **Innovative Climate Solutions Programme with special focus on LDCs and SIDS**

In February 2024, the European Commission awarded the CTCN with an additional USD 2.1 million grant to further bolster technology for climate action in developing countries, for a programme called Innovative Climate Solutions (ICS), with a special focus on LDCs and SIDS. The programme, which will run for 2 years, aims to align seven innovative solutions with countries' needs for transformative and inclusive climate action. All seven technical assistance projects have been selected, one is under implementation, and the others are under bidding process. The technical assistance projects will be to support Kenya, Senegal, Togo, Congo-Kinshasa, Guinea, Mozambique, Colombia, Zimbabwe, Peru, and the Maldives. A number of communications campaigns are planned, including fact sheets for each project.

Activities of the CTCN Partnership and Liaison Office (PALO)

The CTCN, with the support of the Republic of Korea through its partnership and liaison office in Songdo (PALO), has spearheaded activities on collaborative Research, Development and Demonstration (cRD&D) to respond to Parties guidance of Technology Framework. In 2024, the CTCN introduced a Steering Group to identify and develop collaborative such projects. It comprises of Korean government-affiliated research institutes (GRIs) who identify fitting projects within cRD&D focusing on demonstration-oriented cooperation on climate technologies in response to needs from developing countries. Three cRD&D projects, including Papua New Guinea (PNG) "Pre-feasibility study on ocean energy focusing on salinity gradient energy technology and electrochemical ocean thermal energy conversion", Côte d'Ivoire "Household waste to biochar: an alternative to charcoal in Savannah areas", and Bangladesh "Introduce portable mini-solar cold storage for fruits, vegetables, and flowers" have been identified and are in preparation as technical assistances to support pre-feasibility studies for demonstration at a later stage.

[9] Seehttps://www.ctc-n.org/technical-assistance/climate-change-and-security.

At COP29, the CTCN hosted a side event at the Greek Pavilion, bringing together experts from academia, national institutions and think tanks to explore strategies for strengthening National Systems of Innovation (NSI) and advancing cRD&D.

In 2024, the CTCN PALO continued its exchange programme aimed at introducing NDEs to emerging and proven climate technologies. This activity facilitated matchmaking opportunities with technology providers and fostered collaboration in climate technology development and transfer. This initiative was supported, through in-kind contributions, by the Korea Institute of Science and Technology and the Korea Institute of Energy Research.

The capacity building programmes of the CTCN encompassed a variety of activities aimed at fostering innovation and are elaborated on in the chapter on enabling environment and capacity-building.

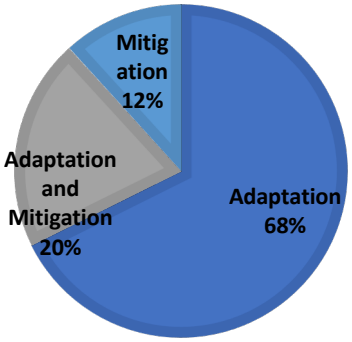
National Digitalization Readiness Index

As part of its knowledge products, the CTCN developed a Digital Readiness Index (DRI) in collaboration with the National Institute for Green Technologies (NIGT), and George Washington University Environmental and Energy Management Institute which was completed in September 2024. The DRI will help assess a country's potential for applying digital tools for transforming key systems, initially focusing on energy infrastructure, to inform and tailor CTCN projects to local needs and digital maturity.

IV. Implementation

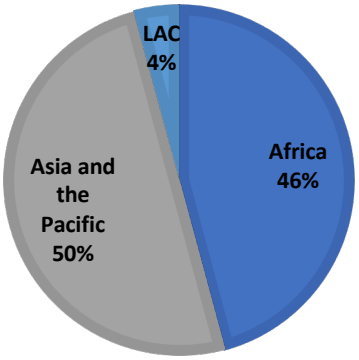
By the end of 2024, the CTCN had processed 105 technical assistance projects. Out of these, 24 had been finished in 2024 with 81 projects at different stages of implementation: 19 projects were under review, 25 in design phase (including 3 under bidding) and 37 were being implemented. For reporting purposes and to prevent duplication, the AOP report will concentrate on the 24 technical assistance projects completed in 2024. A comprehensive list of these 24 projects is provided in Annex 1 of this document.

The implementation of AFCIA I in 2024 has primarily focussed on technical assistances within the Water-Energy-Food nexus, leading to an imbalance across the five system transformation areas. Notably, Sustainable Mobility saw no technical assistance requests closing in 2024, despite several closing in 2023 and two predicted to close in 2025.

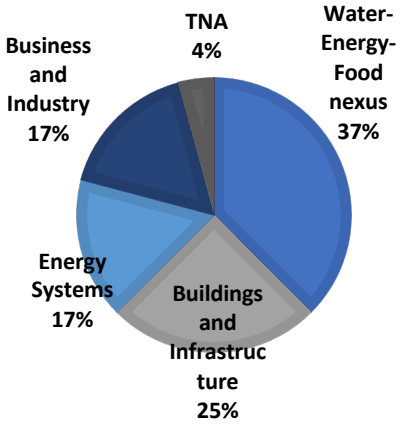


Among the completed Technical Assistance projects, Adaptation accounted for 68% of all requests, reflecting a clear shift in priorities. This trend is largely driven by the focus on Adaptation within the three key programs (AFCIA I, EC) being implemented in 2024.

A similar pattern, although not as pronounced, was observed in 2023, with countries showing an increasing demand for adaptation-focused support or integrated solutions that address both mitigation and adaptation challenges.

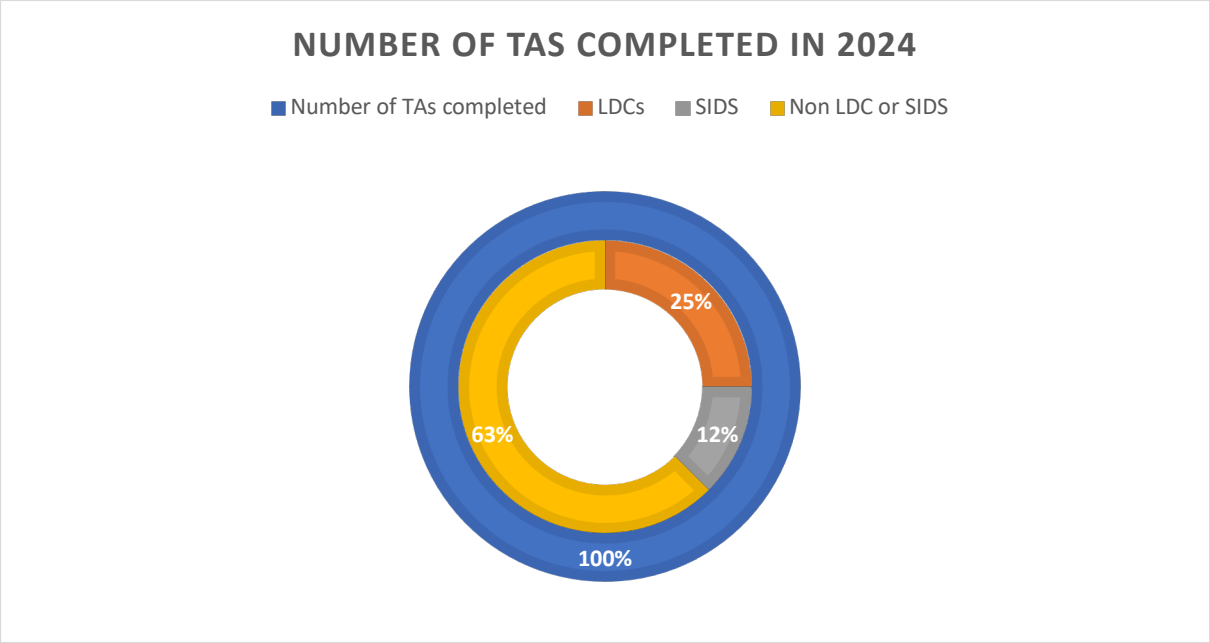


In terms of geographical representation, 4% of completed TAs in 2024 are from the LAC region, with 46 % from the Africa region and half (50%) is from Asia and the Pacific region. For 2024, no TAs were completed in Eastern Europe.



The Water-Energy-Food nexus received the highest number of technical assistance requests with 37 %, while Sustainable Mobility had none.

Out of the 24 technical assistance requests, 3 were in SIDs and 6 in LDCs. A complete list of all technical assistance requests which were completed in 2024 can be found in the following section.



The following section provides an overview of the completed 24 TAs in 2024, categorized based on the five system transformation areas. For a summary of the main outputs and anticipated impacts, please see Annex I.

Water-Energy-Food Nexus

Country	Objective	Title
Eswatini	Adaptation & Mitigation	A feasibility study for the utilization of solar energy for sugarcane irrigation pumping to reduce GHG emissions from the use of carbon rich imported electricity for emerging commercial small cane growers in the Eswatini
Ghana	Adaptation	Promoting and upscaling appropriate solar irrigation technology options for smallholder farmers in Ghana through innovative climate adaptation financing mechanisms, a conducive policy framework for technology regulation and tailored training modules
Indonesia	Adaptation & Mitigation	Identification of technical practices for climate-smart agriculture in Indonesia
Maldives	Adaptation	Establishment of a skimming well gallery system for agricultural use in HDh.Nolhivaranfaru of Maldives (AFCIA)
Nepal	Adaptation	Customized weather and climate information system for climate-resilient agriculture in Nepal (AFCIA)

Pakistan	Adaptation	Improving adaptive capacities of water sector through surface rainwater harvesting technology adoption (AFCIA)
South Africa	Adaptation	Tree Monitoring for Climate Adaptation in the City of Mbombela (Pro-bono K)
Sudan	Adaptation	Strengthening the community-based flood and drought preparedness and early warning system in Sudan using operational and innovative models in addition to Satellite-based transmission technology for real-time automatic water level telemetry system (AFCIA)
Sudan	Adaptation	Soil erosion valuation to support climate resilient agriculture and food security (AFCIA)

Buildings & Resilient Infrastructure

Country	Objective	Title
Bangladesh	Adaptation	Enhancing longer lead-time flood forecasting and strengthened community dissemination in Bangladesh (Pro-bono K)
Pakistan	Adaptation	Adoption of green buildings in Pakistan to achieve Pakistan's Nationally Determined Contribution
Samoa	Adaptation	Developing a framework and methodology to carbon sinks from the forestry sector using Earth observation in Samoa
Solomon Islands	Adaptation	The establishment of an Integrated Coastal Zone Management (ICZM) Plan to protect the mangroves through Ecosystem based adaptation solutions
Tunisia	Adaptation & Mitigation	Smart drinking water network in Tunisia: first phase in Sousse and Monastir (GCF Readiness)
Zimbabwe	Adaptation, Mitigation	Development of Green Building Standards

Sustainable Mobility

Country	Objective	Title

Energy Systems

Country	Objective	Title
Lebanon	Mitigation	Development and implementation of an efficient appliance strategy (GCF Readiness)
Mongolia	Mitigation	Feasibility study of a combined heat and power supply using green hydrogen (Pro-bono J)

Nigeria	Mitigation	Developing an Institutional Framework for the Energy Efficiency Act and Regulations targeting energy intensive sectors (household and industries) in Nigeria
Thailand	Mitigation	Development of national hydrogen strategy and action plan for accelerating Thailand's net-zero target

Business and Industry

Country	Objective	Title
Cambodia	Adaptation, Mitigation	Market assessment in the application of climate technologies in the agriculture sector for rural development in Cambodia
Pakistan	Adaptation	Technologies Framework for Implementation of Nationally Determined Contributions for Pakistan
South Africa	Mitigation	Developing an STI-led cross-sectoral Circular Economy Roadmap for abating GHG emissions in South Africa
Zambia	Adaptation, Mitigation	Development of a framework and roadmap for a National Innovation System to foster low-carbon and climate resilient economic development in Zambia

Technology Needs Assessment

Country	Objective	Title
Chile	Adaptation, Mitigation	Technology Needs Assessment (TNA) and Technology Action Plan (TAP) for Chile's NDC implementation (GCF Readiness)

V. Enabling Environment & Capacity Building

Many TA projects completed during the reporting period were aimed at creating enabling environments for technology development and transfer through the provision of decision-making tools and information, technology identification and prioritization and recommendations for laws, policies and regulations (22 per cent of completed TAs).

Examples of how CTCN support creates enabling environments include: the 'pay as you irrigate' model in Mozambique, developed for smallholder farmers, with a focus on women, which enables beneficiaries to plan, procure and sustainably implement solar powered irrigation systems, considering both their environmental and economic conditions; and the strategy developed for the use of green hydrogen technologies in Thailand, which includes guidance for creating associated policies, a regulatory framework and infrastructure.

Capacity-building initiatives included field visits, bilateral meetings with Network members and potential implementers to explore pro-bono opportunities, and peer-to-peer learning workshops designed to facilitate the development of multi-country projects among nations with similar technology innovation needs. Additionally, whenever feasible, efforts were made to coordinate capacity building workshops with relevant conferences or exhibitions, allowing for the participation of National Designated Entities (NDEs) and stakeholders facilitated by the CTCN.

Examples include a learning visit on Green Hydrogen Production from 25 to 27 June 2024 where 5 researchers and 4 government officers from Cambodia, Mongolia, Thailand and Vietnam met with Korean Government-affiliated Research Institutes (K-GRIs) to gain knowledge on green hydrogen production and facilities and build capacity in research and certification with ongoing discussions around RD&D collaboration between Thai researchers and the Korea Institute of Energy Research as an outcome.

A collaborative RD&D Bridge-Building Workshop was held between 28 October and 1 November in Seoul and Songdo in South Korea with the aim to foster Global South-South, North-South, and Triangular partnerships and highlighting the role of climate technology in implementing NDC 3.0. 21 NDEs were invited to visit the CTCN PALO with 2 Korean GRIs demonstrating their climate technologies to the NDEs. The first day of the workshop consisted of attending the 19th Policy Consultation Forum of the Seoul Initiative Network on Green Growth (SINGG) co-organized by the UN Issue-Based Coalition (IBC) on Raising Ambitions on Climate Action co-chaired by ESCAP and UNEP on understanding the important role of climate technologies in the preparation and implementation of NDC 3.0.[10] CTCN also collaborated with the Incheon Innovation Cluster (IIC, INNOPOLIS+) for the 2024 Incheon International Environmental Technology CONFEX with various sessions, including a technology exhibition and matchmaking with IIC companies. The workshop introduced 32 technology solutions, prepared by prospective Network members, to the NDEs.

In 2024, several network engagements were conducted, including four workshops on technical assistance bidding processes, a Voluntary Technology Talks (VTT) from 3 to 6 June in South Korea to showcase climate technologies and foster partnerships and collaborations

[10] https://www.unescap.org/events/2024/19thSINGGFORUM

for 6 NDEs from Cambodia, Timor-Leste, Maldives, Uganda, Tanzania, and Côte d'Ivoire and a regional VTT for SIDS and LDCs from 4 to 6 September 2024 with 4 NDEs.

Global Capacity Building Programme on Artificial Intelligence

Countries worldwide are increasingly focusing on Artificial Intelligence (AI), with a growing interest in creating a policy framework to develop and deploy climate solutions powered by AI.

In June 2023, the UNFCCC Technology Mechanism launched an Initiative[11] on Artificial Intelligence for Climate Action (#AI4ClimateAction) aimed to explore the role of AI in advancing digitalization and scaling up transformative climate solutions in developing countries. In April 2024, the CTCN Advisory Board and the TEC agreed on a workplan for the #AI4ClimateAction initiative for 2024 – 2027. The Technology Executive Committee (TEC) and the CTCN will jointly 1) provide a space for policy discussions, including UNFCCC national focal points and NDEs, awareness raising, and exchange of knowledge and experience among relevant stakeholders on developing and deploying climate solutions powered by AI; 2) support capacity-building efforts in developing countries to leverage emerging digital technologies and devise locally led solutions harnessing AI; and 3) develop CTCN regional networks of entities supporting AI for climate actions, with a specific focus on LDCs and SIDS.

In 2024, as part of this workplan, the CTCN initiated a global capacity building programme on Artificial Intelligence tailored to the knowledge and needs of each region. The CTCN invited 94 NDEs to exchange theories and applications on AI technologies for future RD&D collaboration. Four tailored trainings organized in conjunction with the Regional NDE forums and with contributions from TEC were held in the Asia, the Pacific, LAC, and Africa regions (see Table 1 below)

[11] https://unfccc.int/ttclear/artificial_intelligence

Following the knowledge transfer and presentations on AI at regional climate weeks, the CTCN received numerous requests and expressions of interest for support in advancing digitalization and scaling up transformative climate solutions in developing countries.

Table 1. Global Capacity Building Programme on Artificial Intelligence

Region	Thematic Focus	Partners	Participants
Asia	Asia and the Pacific Capacity Building on AI4Climate Action	South Korean Network Members , with support from TEC	26 including 12 NDEs
Pacific	Asia and the Pacific Capacity Building on AI4Climate Action	South Korean Network Members, with support from TEC	26 including 10 NDEs
Africa	Africa Capacity Building Programme on AI4Climate Action	Germany (GIZ), with support from TEC	66 including 50 NDEs
Latin America and the Caribbean	LAC Capacity Building Programme on AI4Climate Action	Government of Costa Rica, with support from TEC	42 including 22 NDEs

Global capacity building and knowledge sharing[12]		
Activity	**Objective(s)**	**Quantitative/Qualitative outcome(s)**
Voluntary Technology Talk: Global 7 June, Songdo, Republic of Korea	The Voluntary Technology Talk aims to facilitate the co-creation of scalable technical assistance projects and networking opportunities. Overall, the Talk serves as a platform for developing countries to explore and adopt innovative climate technologies, and fostering international collaboration.	21 participants included 6 NDEs.
Collaborative RD&D facilitation programs: CRD2B2 workshop 28 Oct – 1 Nov, Seoul and Songdo, Republic of Korea	CRD2B2 aims to provide a platform for the NDEs and Korean climate experts to explore technology solutions addressing pressing climate challenges to foster connections among Global South-South, North-South, and Triangular networks.	36 participants
Voluntary Technology Talk: SIDS and LDCs 4-6 September 2024, Busan, Republic of Korea	4 NDEs were in Busan, Republic of Korea, for a two-day event to identify innovative climate technologies.	17 participants included 4 NDEs
Collaborative RD&D facilitation programs: Learning visit on Green Hydrogen Production 25 -27 June 2024, Songdo, Republic of Korea	Learning visit on Green Hydrogen Production from 25 to 27 June 2024 to facilitate North-South and South-South collaboration	15 Participants
Network event on TA bidding process - Energy - WEF - BI - Business - SM	The workshop provided network members with insights into the TA bidding process across the five system transformation areas, CTCN operations, a roadmap for applying, and tips for developing competitive proposals.	50 participants attended

[12] Apart from NDE forums and AI Capacity-Building events which are reported on separately

Expert seminar on Clean Energy with UNITAR CIFAL - Jeju International Training Center 21 November 2024	Support the national consultative session among CTC Network members and Jeju Province in Korea	12 participants including 7 NDEs
Regional Forum on Innovative and Emerging Technologies to Address Climate Change with UNESCAP-APCTT 3 – 4 September 2024	The CTCN presented at a workshop organized by UN ESCAP and the Asian and Pacific Center for Transfer of Technology in the Philippines on Strategic Approaches to Assessing Market Potential for Technology Innovations 4	72 participants including 12 NDEs
Information session with EDB 6 December 2024	CTCN presented on "UNFCCC Technology Mechanism for Climate Impact in Eurasia and Central Asia" at the annual Eurasian Development Bank (EDB) Board meeting	55 participants including 4 NDEs
GCF Regional Dialogue with Eastern Europe and Central Asia 18 – 22 March 2024		20 participants including 5 NDEs
GCF Regional Dialogue with the Middle East and North Africa 24 - 28 June 2024		22 participants including 3 NDEs
Steering Group Meeting for collaborative RD&D 20 June 2024	CTCN announces the first meeting of the Steering Group aimed at collecting collaborative RD&D needs of Korean Government-affiliated Research Institutes (GRIs).	20 participants
Webinar: Launching of Adaptation Fund Climate Innovation Accelerator 9, 10, 15. 16 October 17 December 25 February, 2025 Online webinars	A virtual launch of AFCIA II took place in English, French, and Spanish.	Knowledge sharing event
GCF coordination with Samoa Samoa 21 – 23 May 2024	The CTCN and the National Institute of Green Technology (NIGT) hosted a Samoa climate delegation in Korea to discuss the project's final takeaways, share insights on forest management technologies, and visit the GCF	8 participants including 4 NDEs

GCF coordination with Zambia 24-28 March 2024	A working group workshop in Republic of Korea for a Zambian delegation took place.	10 participants from Zambia
Reducing SF6 Emissions in the Power Sector: The Role of Development Banks	Event organized by the German Federal Ministry for Economic Affairs and Climate Action (BMWK) and GIZ to initiate an exchange on tackling SF6 emissions, including through coordinated and cooperative measures from representatives of development banks, governments and non-state actors and attended by CTCN. CTCN, together with the project proponent from the Kenyan Ministry of Energy and Petroleum, provided a presentation on the SF6 Capacity Building workshop held in July 2023, the potential global SF6 Phase-out Programme and the SF6-related technical assistance in Kenya.	20 participants attended in person and virtually
SB 60 and COP 29 Side Events	The CTCN hosted and co-hosted several side events during SB 60 and COP 29 (while participating in many more) including: • SB60 event on Linkages between TM and FM • 4th meeting of the GCNMA 4 • Presentation on the link between AFCIA and the Global Goal on Adaptation targets at SB60 • NDC Roadmap for the Waste and Water Sector to leverage climate finance (13 Nov, with GGGI) • Side event: Climate Technologies: Impact Stories from Country Support through the UNFCCC Technology	CTCN participated at 15 events at SB 60 and COP29

	Mechanism (14 Nov, with TEC) • Implementation of Technology Action Plans to Realize Ambitious and Feasible NDCs (16 Nov, with UNEP-CCC) • Side event: Climate Action Roadmaps for Buildings and Construction (on 16 Nov, with GlobalABC and the Cooling Coalition, UNHABITAT and UNOPS) • Side Event on Capacities for Climate Innovation: Artificial Intelligence (18 Nov, with PCCB and TEC) • Technology Day on Transformative Industry (18 Nov, with TEC and UNIDO) • Local Innovators, Global Change:Youth Talk (18 Nov) • High-Level Dialogue: Moving Forward with NDC Acceleration in Agrifood Systems: Climate Technology Uptake.(19 Nov, with the TEC and FAO) • New Edition of Green Technology Book on Energy Solutions was launched (19 Nov, with WIPO and ARST) • Strengthening National Systems of Innovation for Collaborative RD&D on Climate Technology (20 Nov, with TEC) • 2024 Gender Just Climate Solutions	

	Awards (20 Nov, with WGC) • Presentation to ICC/BINGO Constituency at COP29	
CTCN outreach: news, newsletters and social media activity	During the reporting period, the CTCN launched: • 28 news releases • 566 social media posts • 13 newsletters	Approximately 13.000 newsletter subscribers 16,196 social media followers (Facebook, Twitter, LinkedIn)

Furthermore, the CTCN was invited to share knowledge on climate technologies at over 20 global conferences and partner events throughout 2024, including during COP 29.

New publications by the CTCN	
Green Hydrogen Technologies for Systems Transformation: Building a compilation of national strategies, plans and projects 2024, Part 2 This second part of a two-part series (Part 1 can be found here) offers a snapshot of the current implementation of green hydrogen projects in Paraguay, Malaysia, Mauritania, and Jordan, providing examples of green hydrogen technology research, development, and deployment efforts and the impact on increasing renewable energy infrastructure and transformation at the national level.	
CTCN 10 YEARS OF ACTION The CTCN marked its 10-year anniversary on 19 April 2024 and marked it with a working reception in the context of an Advisory Board meeting, releasing a report highlighting its work to foster climate resilience and innovation over the past decade. It describes projects ranging from developing green building standards in Zimbabwe to drought risk modelling in Saint Kitts and Nevis, industrial energy efficiency in Pakistan, developing a policy on e-mobility in the Solomon Islands, as	

well as designs for flood management in Burundi to protect crops from the effects of increasing climate catastrophes.	
Technical Assistance Project Fact Sheets and Dashboard Twenty-five fact sheets were created for the AFCIA I projects, and ten fact sheets were developed for the 7 EC Climate Change and Security programme. Additionally, a dashboard was designed for AFCIA I to display impacts by geography and project. Videos will also be developed for selected AFCIA projects.	

Capacity building within technical assistance projects

In-country capacity building is also provided as part of CTCN TAs through hands-on expert advice, policy-oriented training, and peer-learning workshops. For example:

- In Bangladesh, training was provided to government disaster management personnel with stakeholders both from the central and the local governmental level on the use of a forecasting system for hydrological forecasting to ensure a whole-of-government technology transfer aimed at enhancing longer lead-time flood forecasting and strengthened community dissemination.
- In Chile, as part of the TNA project, the CTCN conducted three national workshops for government officials, academia, NGOs and the private sector, to ensure national ownership and deployment of the TAPs. The results from the TNA, which include four technology action plans, are being integrated into the 17 sectoral plans that make up Chile's Climate Change Law. The high-level closure meeting was attended by over 80 representatives from ministries and key stakeholders.
- In South Africa, a series of training sessions and capacity building events were held for employees of the city of Mbombela and the University of Mpumalanga on an integrated forest policy decision support system. The overall concept and mechanism of the system was introduced and trainings were conducted to ensure locally-led maintenance and development of the system in future.

Several TAs also include South-South and North-South learning exchange visits:

- In Pakistan, the Federal Flood Commission, Pakistan Council of Research on Water Resources, and the National Rural Support Programme started collaborating through the TA implementation.

- From 24 to 29 March 2024, a delegation of ten Zambian innovation experts visited South Korea with the aim to receive support on the development of a framework and roadmap for fostering low-carbon and climate-resilient economic growth in Zambia. This initiative, requested by Zambia's Ministry of Technology and Science, aims to build a robust National Innovation System to strengthen Zambia's capacity for climate action.

- From 21 to 23 May 2024, CTCN partnered with the National Institute of Green Technology (NIGT) and Samoa's Ministry of Environment and Natural Resources to host a REDD+ readiness workshop. The goal was to create a framework for estimating carbon sinks in Samoa's forestry sector. Experts from South Korea and Samoa shared insights on forest management technologies, and the delegation visited GCF. The workshop also included seminars on forest carbon management, REDD+ MRV assessments, and climate information services.
- In Sudan, five South-South collaborations were conducted on soil erosion through partnerships between the Sudanese Regional Centre for Mapping of Resources for Development (RCMRD) and various Sudanese universities and research stations, including University of Kordofan, ARC - Shandi Research Station, University of Khartoum, Jomo Kenyatta University of Technology, and International University of Africa.

VI. Collaboration and stakeholder engagement

National Designated Entities

In 2024, the CTCN continued to host its flagship regional NDE forums, organized in collaboration with the TEC:

Asia NDE Forum
1-5 July - Songdo, Republic of Korea

This year's programme brought together 12 NDEs from Asia to focus on past and future climate technology development and transfer included updates on the Technology Mechanism's Joint Work Programme, reflections on the recent joint TEC and CTCN Advisory Board session, an overview of CTCN's technical assistance in Asia, insights into capacity-building and collaboration initiatives, discussions on technical assistance projects for system transformation in Asia, and opportunities for collaborative RD&D and investment for climate change actions.

Over the course of five days in each forum, the CTCN and TEC facilitated a series of knowledge-sharing activities with objectives to showcase regional progress, highlight available technologies for advancing climate system transformation, and foster collaboration in research, development, and investments for global climate change mitigation.

Throughout 2024, several additional capacity-building programs were provided to NDEs, including:

- Thematic capacity-building programs targeting NDEs on the themes of AI in climate change and bidding for CTCN technical assistances.
- Participation in workshops on co-creating solutions with network members to showcase technology and explore twinning arrangements for collaborative RD&D. Through the Bridge-building Workshop initiative, CTCN engaged NDEs to identify national counterparts for technology transfers. For example, at the World Climate Industry Expo, four NDEs from SIDS and LDCs explored matching collaborative RD&D opportunities between 180 prospective Network members and 21 Korean Network members.

CTCN Network Members

The CTCN welcomed 59 new Network members in 2024, of which 29 were from developing countries, bringing the total number of Network members to 894 members.

In 2024, the CTCN actively engaged Network members to mobilize their technical expertise in all services areas of the CTCN. For instance, network members with emerging technical solutions (green hydrogen, SF6, AI etc) were invited to share their innovations through various activities including publications, workshops, trainings and webinars fostering the exchange of knowledge. In addition, the CTCN prominently featured their solutions through emails and newsletters, reaching a wider audience and showcasing their impacts within the network.

In 2024, to stimulate members' engagement, CTCN organized global Networking events:

1. A CRD2B2 workshop in conjunction with the 19th Policy Consultation Forum of the Seoul Initiative Network on Green Growth (SINGG), 2024 Incheon International Environmental Technology Confex and GreenEner TEC
2. Voluntary Technology talks (VTT), including at the World Climate Industry Expo 2024
3. Hosting delegations from Samoa and Zambia to ideate on scale-up of TAs near-completion with the Korean National Institute of Green Technology (NIGT).

The VTTs resulted in 23 matchmaking opportunities. As a result of one matchmaking opportunity in particular, a compressed biogas digester will be implemented by two South Korean institutes in Tanzania. Visiting delegations from Samoa and Zambia explored Korea's innovation ecosystem, exchanged insights, and forged connections through workshops dissecting policy frameworks to visits at key innovation support hubs.
The CTCN continues to harness the power of partnerships with the private sector, with a growing number of companies working in AI and digital technologies joining the Network.

Engagement with other UNFCCC constituencies and actors

UNFCCC Women and Gender Constituency

Gender Just Climate Solutions

As part of its collaboration with the Women and Gender Constituency (WCG) and Women Engaged for a Common Future (WECF), the CTCN supported the 2024 Gender Just Climate Solutions Award, including by serving on the jury to select a winner under the technical category for the 2024 edition at COP29[13]. CTCN also disseminated information about the award through its communication channels[14] and facilitated access to a year-long mentoring programme for the award winners. Additionally, the CTCN contributed to the GJCS 2024 Publication by drafting three stories under the technical category.

In addition to collaborating on the 2024 edition of the Gender Just Climate Solutions Award, the CTCN, jointly with the TEC, continued promoting, with the Women and Gender Constituency, the Technology Mechanism and Climate Technology Expert Roster. This global database, provided free of charge, features professionals, grassroots experts, and indigenous individuals with ancestral knowledge, all recognized as experts in gender equality and climate technology and available to participate in studies, events, and projects.

Furthermore, the CTCN continued implementation of its Gender Policy and Action Plan, endorsed at the 22nd Advisory Board Meeting, by developing a gender workplan for 2024. This Plan introduced specific targets across key areas, including CTCN Operations, Capacity Building, Network and Partnerships and Knowledge Sharing and Communication . A notable enhancement in the updated policy is the allocation of a minimum of 5 percent of the TA budget for the gender mainstreaming activities. To support this, the CTCN has developed the Gender Assessment and Action Plan and has initiated work on a monitoring tool. This tool will enhance both the CTCN and the Network/Implementing partners ability to qualitatively assess how the allocated budget is utilized for gender mainstreaming efforts.

[13] https://www.wecf.org/the-2024-gender-just-climate-solutions-awardees/
[14] TBA

UNFCCC Business and Industry NGOs (BINGO)

The BINGO Advisory Board representative enabled the CTCN's Advisory Board Chair to introduce the CTCN during an event at the New York Climate Week for the BINGO constituency as well as provided CTCN with the opportunity to discuss potential scale-up of technical assistances with the ICC.

Youth and academic institutions

Throughout 2024, the CTCN engaged in collaborative efforts with several academic institutions, including:

- A joint research partnership with George Washington University and the National Institute of Green Technology on the National Digitalization Readiness Index (see the Innovation section)
- Collaboration with the UN Economic and Social Commission for Asia and the Pacific (ESCAP) on their *Asia-Pacific Digital Transformation Report 2024*
- At COP29, the CTCN hosted a side event at the Greek Pavilion, bringing together experts from academia, national institutions and think tanks such as from UNU-FLORES; Thailand's Office of National Higher Education Science Research and Innovation Policy Council; Future Cleantech Architects; the African Centre for Technology Studies; and the Hellenic Foundation for European and Foreign Policy.
- KOICA-INU Master's Degree Programme collaboration where the CTCN facilitated a global call for expressions of interest for junior trainees from developing countries to participate in a master's program on climate technology and governance. This initiative is supported by scholarships from KOICA. As part of this university program, the CTCN will also offer ongoing mentoring to the junior trainees on climate technology project design and development.

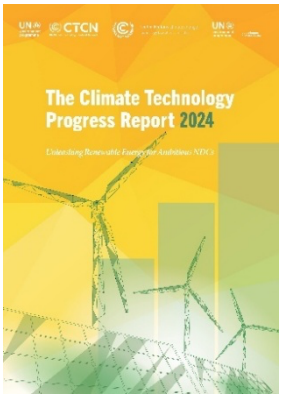
Following the successful collaboration between the CTCN, the UNFCCC youth constituency YOUNGO, and Network members Seedstars and SAEFEEM in conducting the Youth Climate Innovation Labs and Academies, the second edition of the Youth Climate Innovation (YCI) Programme was launched in September 2024 and will run until December 2025. The YCI aims to supporting young innovators across Africa, Latin America and the Caribbean (LAC), the Middle East and North Africa (MENA) and Asia Pacific to identify, develop and scale high-impact climate technology solutions. The programme consists of three phases:

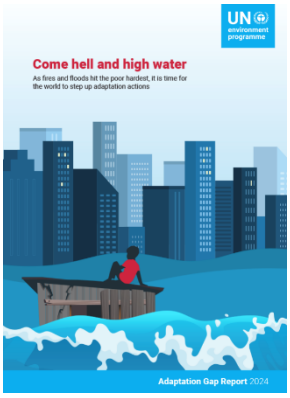
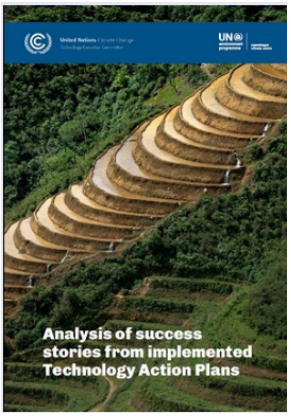
1. Idea Labs: A 7-day online event where participants use design thinking tools to brainstorm climate solutions.
2. Incubator Phase: a 12-week online mentoring program to refine and test these solutions.
3. Accelerator Phase: A 4-week hybrid support program that includes funding and partnerships to fast-track these solutions.

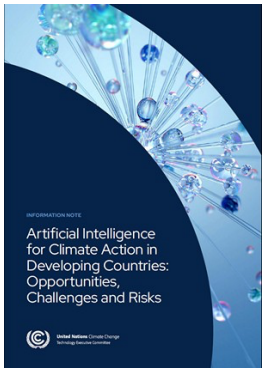
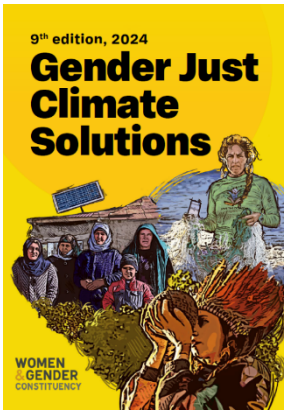
At the end of 2025, two winning teams from each region will be invited to an in-person pitch event at COP30. Additionally, mentorship, partnership, and private sector investor networks will be established to support participating teams during and beyond the YIC Programme.

UNFCCC Paris Committee on Capacity-building (PCCB)

At COP29, the Paris Committee on Capacity-building (PCCB), the Climate Technology Centre and Network (CTCN), and the UNFCCC Technology Executive Committee (TEC) partnered to address developing countries' capacity-building needs in using artificial intelligence (AI) for climate action. Under the Technology Mechanism's Initiative on AI for Climate Action, the event "Capacities for Climate Innovation: Artificial Intelligence" explored AI's transformative role in climate adaptation and mitigation, with a focus on LDCs and SIDS.

Publications the CTCN contributed to	
3rd edition of the Green Technology Book In collaboration with the World Intellectual Property Organization – WIPO and the Egyptian Academy of Scientific Research and Technology (ARST), the third edition of the book focuses on energy technologies and the crucial role of energy efficiency and presents a deep dive into the potential for mitigation through technology deployment in key sectors, all connected to the accessible and inclusive WIPO GREEN Database of Needs and Green Technologies. The database showcases a wider array of solutions and facilitates direct contact with technology proprietors. Additionally, the Green Technology Book serves as an important matchmaking tool for fostering connections and partnerships in the field. CTCN was one of the reviewers of this publication.	
The Climate Technology Progress Report – 2024 UNEP-Copenhagen Climate Centre, in collaboration with the TEC and the CTCN launched the 2024 edition of the Climate Technology Progress Report. The focus of the 2024 edition of the report focusses on renewable energy technologies and the progress made, the challenges ahead, and the key actions needed to accelerate technology development and transfer globally. A CTCN case study from Burkina Faso featured in the report.	

[Adaptation Gap Report 2024] UNEP-CCC's Adaptation Gap report finds that as climate impacts intensify and hit the world's poorest, *The Adaptation Gap Report 2024: Come hell and high water* finds that nations must dramatically increase climate adaptation efforts, starting with a commitment to act on finance. The CTCN contributed to this report.	
[Analysis of success stories from implemented Technology Action Plans] This TEC analysis paper, developed in collaboration with UNEP-CCC, draws on the experience of six developing countries across three regions – Antigua and Barbuda, Armenia, Ghana, Grenada, Libera and Pakistan. The CTCN contributed to this report.	
[Climate Technologies for Agrifood System Transformation: Placing food security, climate change and poverty reduction at the forefront] The TEC, in collaboration with the FAO, analysed knowledge gaps and identifies relevant climate technologies to promote transforming the agrifood systems, as set out in its rolling workplan 2023-2027. The CTCN contributed to this report.	

[AI for Climate Action in Developing Countries: Opportunities, Challenges and Risks] This information note has been prepared by the Technology Executive Committee (TEC). It provides an overview of the opportunities, risks and challenges of using artificial intelligence (AI) for climate action in developing countries, with a focus on least developed countries (LDCs) and small island developing States (SIDS). The CTCN contributed to this report.	
[Gender Just Climate Solutions 2024 (9th edition)] Sustainable and gender-just solutions to the climate crisis already exist on the ground and many of them are women-led. This is why each year during COP gatherings, WECF and the Women and Gender Constituency organize the Gender Just Climate Solutions Awards. Through the Awards, we promote and support outstanding projects that provide grassroots climate solutions, have women leadership and promote gender equality. The Awards comprise three categories: ○ Technical Solutions ○ Non-Technical Solutions ○ Transformational Solutions CTCN contributed to the 9th edition of the Publication by drafting three stories under the technology category.	

VII. Support

Collaboration with the Adaptation Fund

In addition to its collaboration with the Adaptation Fund under the first edition of the AFCIA programme (refer to the Innovation section), the CTCN was awarded phase II of the AFCIA programme in June 2024, with a total of 10 million USD for 60 technical assistance requests supporting the testing and piloting of innovative climate adaptation technologies through locally led climate action. Additionally, the CTCN, together with the United Nations Development Programme, was selected to oversee the coordination of AFCIA grants over the next three years, with a budget of USD 3.7 million.

Collaboration with the Global Environment Facility (GEF)

With the GEF, the NDEs of Ghana, Jordan, Kazakhstan, Lebanon and Nigeria participated in the GEF national dialogues in their respective countries to facilitate further coordination with GEF operational focal points and explore potential cooperation with them at the national level.

The CTCN is also a member of the Steering Committee for Phase IV of the Global GEF TNA project.

Collaboration with the Green Climate Fund (GCF)

The CTCN completed two GCF readiness projects in 2024, bringing the total number of GCF readiness projects implemented by the CTCN to 34 (11 million USD) since 2017:

Country	GCF project
Lebanon	Development and implementation of an efficient appliance strategy
Tunisia	Smart drinking water network in Tunisia: first phase in Sousse and Monastir

The CTCN and the GCF participated in several of each other's events, fostering collaboration and knowledge exchange: The CTCN and NDEs took part in two GCF regional dialogues during the reporting period; the GCF Regional Dialogue with Eastern Europe and Central Asia in March 2024 (5 NDEs) and with the Middle East and North Africa in June 2024 (3 NDEs were invited); in April 2024 the Advisory Board Chair participated in the GCF webinar on the FP198 CATALI.5°T Initiative for technology incubation and acceleration; the GCF contributed to CTCN learning events and technical workshops, engaging experts on topics such as buildings and infrastructure and the water–energy–food nexus; the GCF hosted NDE delegations from Samoa and Zambia at its headquarters; and the GCF participated in the regional NDE forums held during the reporting period.

At COP29, the GCF announced a new chapter of collaboration, approving $540,000 in Project Preparation Facility (PPF) funding for a project by the KCB Bank, developed with the support of the CTCN and its Network member Sustainable Solutions for Africa. The project will support SMEs in Kenya to adopt environmentally sound technologies and marks both KCB's first GCF PPF funding and the CTCN's first such support for large-scale project

implementation. The full project, valued at $218 million, will be submitted to GCF in 2025 and aims to impact over 2 million direct beneficiaries.

Another application for PPF funding is under development with the West African Development Bank (BOAD). The project targeting the introduction of a "West African Low Emissions and Climate Resilient Agriculture Financing Facility" in the amount of USD 210 million, with USD 110 million from the GCF, was discussed with West African countries in February 2023 in Lomé, Togo. A draft application was finalized by Q3 2023. In January 2025, BOAD has confirmed that a new approach has been adopted for this project and that is still is part of the Bank's pipeline.

Pro-bono Technical Assistance Support

In 2024, three technical assistance requests were completed with pro-bono support in the amount of approximately 400.000 USD from the Republic of Korea and Japan.

Bangladesh	Enhancing longer lead-time flood forecasting and strengthened community dissemination in Bangladesh (Pro-bono K)
Mongolia	Feasibility study of a combined heat and power supply using green hydrogen (Pro-bono J)
South Africa	Tree Monitoring for Climate Adaptation in the City of Mbombela (Pro-bono K)

Engagement with the Private Sector and Philanthropies

1) Grundfos Foundation: A first meeting took place in August 2024 and several technologies within the WEF nexus were introduced with conversations around how to collaborate.
2) Global cement and concrete Association (GCCA): The CTCN continued to collaborate with GCCA on cement decarbonization with several technical assistance requests related to cement decarbonization, including roadmaps and technology feasibility studies, being prepared based on country demand.
3) Global initiative on SF6 management and phase-out: The CTCN was coordinating with GIZ on the joint preparation of a global initiative on SF6 management and phase-out with support from the Federal Government of Germany. Initial discussions to jointly access European Development Bank/IKI funding did not result in a funding outcome. Further outreach with the concept note is foreseen in 2025.
4) Google: A meeting with the Google Foundation was organized in October 2024 and initial conversations were taking place around Google supporting the YCI Programme.
5) Novo Nordisk Foundation: A first meeting took place in April 2024 with talks continuing around a collaboration on reducing GHG emissions in agriculture.
6) Pepsi MENA: A meeting took place in December 2024 on the YCI Programme and initial interest was expressed in supporting incubators and providing mentoring and support from Climate Youth Innovators from the MENA region.

Apart from these engagements, several conversations have been held in 2024 with a view towards scaling up technical assistances with Multilateral Development Banks such as Asian Development Bank (ADB) Conversations have been ongoing since April 2024 on signing an MoU and potential financial contribution from EDB on co-financing a Technical Assistance on industrial decarbonization in Central Asia, the CTCN gave a presentation at

the Annual Board meeting of the EDB and the EDB attended the 23rd AB meeting of the CTCN.

Co-funding and in-kind support

The CTCN also received co-funding and in-kind support from various partners for technical assistance interventions, capacity building activities, and events:

Co-financing	The Ministry of Water and Environment of Uganda is funding a stakeholder workshop for the development of a GCF project proposal which will implement some of Uganda's TNA outcomes and TAPs by deploying prioritized climate technologies in Eastern Uganda. The total project amount is USD 10 million.
In-Kind	Bangladesh (Flood Forecasting System Enhancement) – Included an in-kind contribution from the Korea Institute of Science and Technology

Facilitating the leveraging of follow-up financing for TA outputs and recommendations

The completion reports for CTCN TA projects outline potential additional financing opportunities resulting from the TA. However, securing such funding is not guaranteed and depends on factors beyond the CTCN's control. The below is an overview of potential leveraging of additional financing from CTCN TAs completed in 2024:

Country	TA name Information on Concept Note developed or follow-up action	Expected funding leveraged from the TA
Bangladesh	*Technical Assistance for Enhancing longer lead-time flood forecasting and strengthened community dissemination in Bangladesh* 1 GFC Concept Note was prepared: Enhancing Climate Resilience through Multi-Hazard Early Warning Systems in Bangladesh	25,000,000 USD
Burundi	*Easily deployable water-filled flood barrier that can be used to prevent damage from flooding and to store water vapor-tight to ensure water availability in times of drought.* The Concept Note was approved by the AF in 2024 and a Full Proposal is being formulated.	5,000,000 USD
Cambodia	*Market assessment in the application of climate technologies in the agriculture sector for rural development in Cambodia* Developing and submitting 1 GCF Concept Note for financing, focusing on climate-smart technologies and financial solutions for farmers with the high-priority funding needs identified specified as solar cooling, bio-digesters, water management, and post-harvest technologies	
Chile	*Technology Needs Assessment (TNA) and Technology Action Plan (TAP) for Chile`s NDC implementation.*	23,863,000 USD

	Approximate costs of implementing only the project ideas for technologies proposed in the Technological Action Plan were provided. 1 Concept Note was developed: "complete early warning system in Ñuble – Biobío".	
Eswatini	*A feasibility study for the utilization of solar energy for sugarcane irrigation pumping to reduce GHG emissions from the use of carbon rich imported electricity for emerging commercial small cane growers in the Eswatini* Exploring financing models for cane growers to install solar-powered irrigation systems, with potential funding from local financial institutions and international development organizations	23,000,000 USD
Maldives	*Establishment of a skimming well gallery system for agricultural use in HDh. Nolhivaranfaru of Maldives* The Concept Note was formulated and is currently being revised by CTCN Secretariat.	5,000,000 USD
Pakistan	*Technologies Framework for Implementation of Nationally Determined Contributions for Pakistan* GGGI-Korea Trust Fund already mobilized 158,000 USD for project development. 4 Concept Notes were prepared: • AI-Integrated Remote Sensing for Water Resource Management • Biochar Production and Utilization for Agriculture and Circular Economy • Improved Irrigation Approaches • Strategy for Mitigating Methane Emissions in Organic Waste	59,958,000 USD
Samoa	*Developing a framework and methodology to carbon sinks from the forestry sector using Earth observation in Samoa* A CN has been put forward on a 3-year feasibility study and demonstration	1,100,000 USD
Tunisia	*Smart drinking water network in Tunisia: first phase in Sousse and Monastir* 1 GCF Readiness Concept Note was prepared.	437,280 USD
Thailand	*Development of national hydrogen strategy and action plan for accelerating Thailand's net-zero target* 1 GCF Concept Note was prepared for "Waste to Energy Promotion in Campuses and Small Cities".	$28,500,000 USD
Total	13 Concept notes and project proposals developed as a result of CTCN TAs completed in 2024	171,858,280 USD

VIII. Reporting against the 2024 Annual Operating Plan Indicators

Actions & Activities (as per the POW)	Updated Indicators (As approved at CTCN AB 22)	2023	Result for 2024
Impact indicators	Anticipated metric tons of CO2 equivalent (tCO2e) emissions reduced or avoided as a result of CTCN TA (disaggregated by annual and life of project)	No target	**Annual:** 43.927 million tCO2e **Life of the project:** 570.4 million tCO2e
	Anticipated number of direct and indirect beneficiaries as a result of the TA	No target	66 million indirect beneficiaries
Innovation			
Intended outcome (from POW): Countries can accelerate innovation at different stages of the technology cycle through collaborative approaches.			
1.1 Support policies, institutional and regulatory frameworks and planning processes on innovation and strengthening National Systems of Innovation 1.2 Develop technological transition pathways and options for uptake of climate technologies	Number of countries that received. CTCN support for national institutional, legal, and regulatory frameworks to encourage climate technology RD&D and uptake (PMF indicator # 1.2.a)	4-5	9
	Number of countries with strengthened National System of Innovation as a result of CTCN support. (PMF indicator # 1.2.b)	5-7	11
1.3 Promote collaboration and partnerships in climate technology RD&D activities	Number of climate technology RD&D and innovation-related events (PMF indicator # 1.1.a)	5	11
	Number of participants in climate technology RD&D and innovation-related events (gender- disaggregated) (PMF indicator # 1.1.b)	100-150	283 total (Men: 62%, Women: 38%)
	Number of knowledge resources related to RD&D and new and innovative technologies made available on the CTCN knowledge platform (PMF indicator # 1.1.c).	25-30	21

Implementation			
Intended outcome (from PoW): Countries have clear pathways and options to enhance inclusive, gender responsive, technology development and transfer, including endogenous and indigenous technologies			
2.1 Prioritize climate technologies and facilitate the development and implementation of NDCs, including TNAs, roadmaps and pilot studies and alignment with NAPs	Number of TAs supported (disaggregated by TA and FTA, and TNA/TAP/NDC) (PMF indicator # 2.1.a)	30	24 (24 TAs including 1 TNA) 105 TAs were in different phases of implementation in 2024: *24 TAs were completed * 25 TAs were in design stage out of which 3 were under bidding * 19 under review * 37 under Implementation
	NDE feedback on uptake of CTCN TA and non-TA recommendations and outcomes to enhance technology development and transfer	No target	6
	Percentage of TA budget allocation targeting gender mainstreaming. (new)	5 % of each TA budget	The CTCN has consulted with WGC and is developing a monitoring tool that will be used to quantitatively measure and ensure that 5 % of the TA budget is used for gender mainstreaming and action. While every TA has a percentage of the budget that goes to gender mainstreaming, it is yet to be

			analytically quantified.
	Percentage of TA projects supported with a gender analysis (PMF Indicator # 4.2.e).	100%	100% As of 2024, all technical assistance response plans and those that were kicked off following the decision at the AB 2023, included a Gender assessment and action plan (GAAP) as one of the mandatory documents to guide the implementation of each TA. Of the 24 TAs closed in 2024, 4 included gender analysis and 11 included gender mainstreaming
Enabling environment and capacity-building			
Intended outcome (from PoW): Countries have enhanced enabling environments, including policy and regulatory environments to develop, transfer and deploy climate technologies			
3.1 Design policies, regulations and standards that create enabling environments for climate technologies and deliver capacity-building	Number of policies, strategies, plans, laws, agreements or regulations supported by the technical assistance (PMF indicator # 4.2.a)	10	21
3.2 Enhance the capacity of the NDEs to plan, monitor and achieve technological transformation	Number of CTCN training sessions and capacity strengthening activities (PMF indicator # 4.2.b)	10	17
	Number of participants attending CTCN training sessions and capacity strengthening activities (disaggregated by gender) (PMF indicator # 4.1.d.)	1000 - 1500	1158 (840 m, 318 f) (72,5% m, 27,5% f)
	Total number of events organized or co-organized by	15	38

	the CTCN (PMF indicator # 4.1.c.)		
	Number of technology descriptions, publications, national plans, and other information resources made available on the CTCN knowledge platform (PMF indicator # 4.1.a)	100	~100
	Number of site visits to CTCN knowledge portal (indicator 4.1.e)	10% increase compared to 2023	114% increase 267K views in the last year, with 175k users coming from organic search.
	Number of people reached through CTCN social media channels (PMF indicator # 4.1.f)	10% increase compared to 2023	Social Media followers increased by: 75.3% on LinkedIn (from 3996 followers to 7006 followers) 13.4% on Facebook (from 3719 to 4218 followers) 1.3% on Twitter – from 4930 to 4978 followers
	Number of mentions of CTCN in media (PMF indicator # 4.1.g)	30	CTCN was mentioned in the media (traditional and online) 840 times. The most popular topics in the last year were: (EC Climate Security Programme with reference to different projects in

			particularly Africa) and YCI Programme.
Collaboration and stakeholder engagement			
Intended outcome (from PoW): Stakeholders are actively engaged and have strengthened capacity to implement climate action through collaboration			
1.1 Promote collaboration and partnerships in climate technology RD&D activities	Number of partnership and twinning arrangements (new)	5- 10	5
1.1 Support policies, institutional and regulatory frameworks and planning processes on innovation and strengthening National Systems of Innovation (NSI)	Number of deliverables produced during the technical assistance) (PMF indicator # 3.1.a)	80-100	174
4.1 Strengthen knowledge and engagement in an inclusive manner and facilitate collaboration among relevant international organizations, the private sector, academia, and civil society	Total number of members in the CTC Network (PMF indicator # 3.2.a)	3-5% increase compared to 2022	7% increase compared to 2023
	Number of collaborations with international organizations, private sector, academia, civil society organizations and Network members for the co-development of activities, including trainings, workshops, and knowledge products. (new)	10 – 15	29
	Number of matchmaking events organized (new)	3-5	6
Support			
Intended outcome (from PoW): Countries have access to Technical Assistance and financial support to enhance development and transfer of gender responsive technologies			
5.1 Facilitate access to Financial Mechanism of the UNFCCC and mobilize various types of support including pro- bono and in-kind support	Number of events and trainings co-organized with finance institutions including the operating entities of the Financial Mechanism (GEF, GCF), the Adaptation Fund and MDBs (PMF indicator # 5.1.a)	3-5	4
	Percentage increase of funding mobilized from existing bilateral donors and through new donor Parties (revised from PMF indicator # 5.A)	Actual target dollar amount to be calculated based on the endorsed resource	% increase will be calculated at the end of the 5-year period Total contribution

		mobilization and partnership strategy which reads: At least 20% increase of the baseline over the PoW period. Baseline: 2018-2022 total contribution from bilateral donor: USD 37,503,081	from bilateral donors thus far for 2023-2027: 23,130,576 (62% of the total funding that was mobilized for the 2nd PoW period has already been mobilized in the second year of the 3rd PoW period)
	Number of CTCN technical assistance supported by the GEF/GCF/AF (PMF indicator # 5.1.c)	8 - 10	9 (6 AFCIA; 3 GCF Readiness)
	Percentage increase in funding mobilized through resources from relevant operating entities of the Financial Mechanism, the Adaptation Fund, and other international financial institutions (new)	Actual dollar amount target to be calculated based on the endorsed resource mobilization and partnership strategy which reads: At least 100% increase over the PoW period	10,000,000 USD was awarded for AFCIA II and 2.7 million USD were awarded to UNEP-CTCN and UNDP for coordination services and 540.000 USD for GCF PPF (over 100 % increase)
	Value of pro bono and in-kind support secured for CTCN activities (PMF indicator # 5.2.a)	Actual donor amount target to be calculated based on the endorsed resource mobilization and partnership strategy which	400,000

		reads: At least10 – 15 % increase over the PoW period	
	Level of donor engagement (disaggregated by bilateral donor Parties, and international financial institutions) (PMF indicator # 5.2.b)	20 donors engaged	20 (15 bilateral donors; 5 international financial institutions)
	Level of engagement with private sector and philanthropic organizations (new)	Develop partnerships with a minimum of 1 private sector and/or philanthropic organization	1partnership approved
	Number of technology proposals developed through CTCN technical assistance anticipated to be supported by the GEF/GCF/AF and other finance entities, including matchmaking (PMF indicator # 5.2.c)	3-5	13 *13 CTCN TAs completed in 2024 with CNs developed: 2 AFCIA Concept Notes and 11 GCF
	Number of impact stories developed and disseminated widely (new)	4-6	28 news pieces 5 stories

Annex 1: List of CTCN Technical Assistance Projects Completed in 2024

A. Technical Assistance: Water-Energy-Food-Nexus

| Eswatini|	**| Adaptation & Mitigation |**	**| Economics and financial decision-making|**	**|Digitalization |**
A feasibility study for the utilization of solar energy for sugarcane irrigation pumping to reduce GHG emissions from the use of carbon rich imported electricity for emerging commercial small cane growers in the Eswatini			
Output: • Eswatini sugarcane farmers will i) have options for solar irrigation systems that they can adopt in their farming practice as opposed to relying on grid electricity powered by machinery that is expensive, ii) reduce their GHG emissions by adopting new renewable energy options, and iii) provide financing options available to enable them to adopt to solar energy powered systems. **Expected impact and/or follow-up action:** • An intervention to solarise sugar cane energy demand would represent an 11% saving nationally on energy use and 4.5% of national GHG emissions. The project raised awareness of solar and service suppliers required to support greater women's participation. **Gender considerations:** • Women farmers and entrepreneurs will, through the development of a gender action plan during the writing of funding proposals, be encouraged and targeted to participate in the project.			

|Ghana|	**| Adaptation & Mitigation |**	**| Technology identification and prioritisation |**	**|National System of Innovation |**
Promoting and upscaling appropriate solar irrigation technology options for smallholder farmers in Ghana through innovative climate adaptation financing mechanisms, a conducive policy framework for technology regulation and tailored training modules			
Solar powered irrigation systems (SPIS) provide a flexible and renewable energy source that enables smallholder farmers to access water resources in an efficient manner during periods of water scarcity, benefiting productivity and food security. Rather than solely depending on rainfall for irrigation, smallholder farmers would benefit from irrigation systems that efficiently utilize available surface water and ground water reservoirs. SPIS			

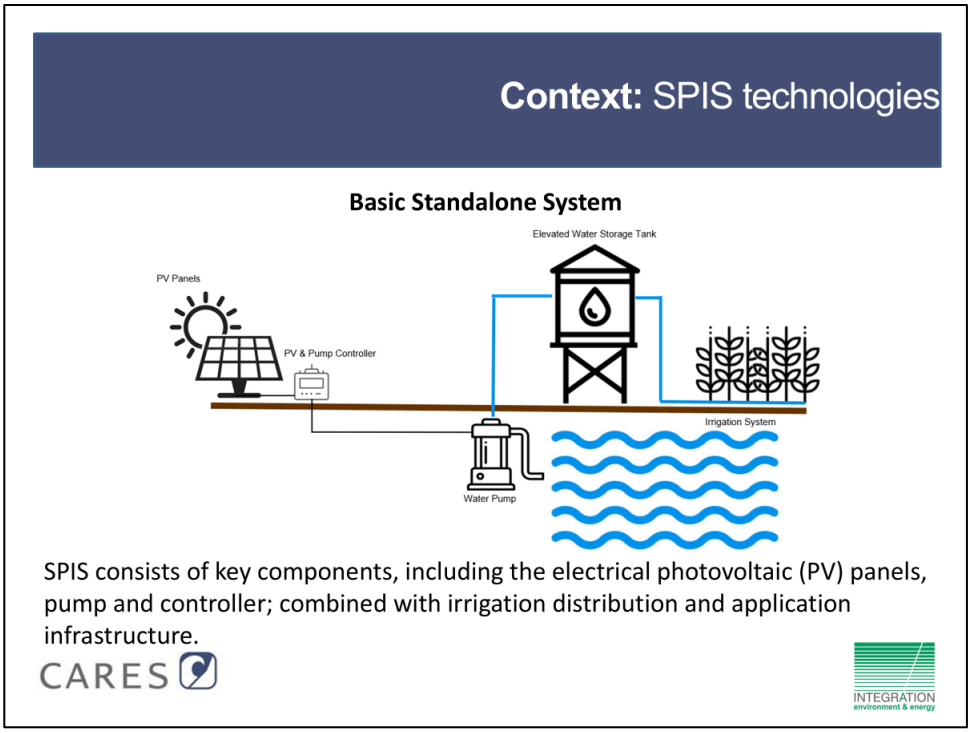
provides reliable and affordable energy for irrigation, especially in remote rural areas where diesel fuel is expensive or where access to electricity from the grid is lacking. As costs for SPIS have dramatically decreased over the past decade, solar technologies are becoming a viable option for smallholder farmers. Although SPIS technology has been widely introduced for agriculture in some countries, it has not as yet fully penetrated the Ghanaian market.

Output:

- Provide a sustainable and efficient means of irrigation for smallholder farmers by providing bankable proof of technology concepts, including available technology options best suited to smallholder farmers along with a cost-benefit analysis; policy and legislature framework for technology standards and certification; financing structures targeted at smallholder farmers; and training modules for stakeholders across the supply chain.

Expected impact and/or follow-up action:

- Obtaining access to a sustainable source of water supply through SPIS enables women engaged in agricultural practices in Ghana to improve agricultural productivity and food security for their families. Providing solar irrigation solutions at the farm site increases security and time effectiveness. In addition, by increasing the productivity of smallholder farmers and targeting women specifically, it is more likely that additional revenue will be spent on healthcare, children's education and nutritious meals.
- The provision of SPIS contributes to Ghana's NDC, which references improved water resource management as an adaptation intervention, increased penetration of renewable energy solutions for rural areas, increased agriculture resilience for food security, and increased community-based conservation agriculture.



|Indonesia|	**| Adaptation & Mitigation |**	**| Communication and awareness, Economics and financial decision-making |**	**|National Systems of Innovation |**

Identification of technical practices for climate-smart agriculture (CSA) in Indonesia

Output:

- A comprehensive technology review assessed existing sensor, drone, and satellite imagery applications, followed by a feasibility analysis identifying key barriers and solutions. A macro system framework was designed to integrate CSA technologies, supported by a cost-benefit and financing mechanisms analysis. Additionally, training workshops were organized to equip stakeholders with the necessary knowledge for CSA adoption, ensuring sustainable and climate-resilient agricultural practices.

Expected impact and/or follow-up action:

- Increased agricultural productivity through smart farming techniques.
- Enhanced resource efficiency in water and fertilizer use.
- Reduced greenhouse gas emissions from optimized land and resource management.
- Improved food security by supporting climate-resilient agriculture.

Gender considerations:

- Emphasized the role of women farmers in adopting CSA technologies.
- Ensured gender inclusivity in policy recommendations for CSA implementation.

|Maldives|	**| Adaptation |**	**| Piloting and deployment of technologies in local conditions|**	**|National Systems of Innovation |**

Establishment of a skimming well gallery system for agricultural use in HDh.Nolhivaranfaru of Maldives

Output:

- Through this project, a sustainable groundwater extraction system for agricultural practices will be established, and unpolluted groundwater aquifers will be protected in HDh.Nolhivaranfaru Island.

Expected impact and/or follow-up action:

- Sustainable water supply for irrigation in agriculture would be established and the protection of unpolluted groundwater aquifers in HDh.Nolhivaranfaru Island will be protected.
- Capacity building and knowledge increase of farming communities on the island and other stakeholders on sustainable agricultural practices and water use efficiency for agriculture will be strengthened which contributes to the increasing the capacity of climate change adaption in the Maldives.

|Nepal|	**| Adaptation |**	**| <u>Piloting and deployment of technologies in local conditions</u> |**	**|Digitalization|**

Customized weather and climate information system for climate-resilient agriculture in Nepal

Output:

- The development of an application programming interface (API) for the automatic dissemination of location-specific customized three-days weather forecast to farmers in a user-friendly language through appropriate dissemination mechanisms that will be tested in selected communities in Nepal.

Expected impact and/or follow-up action:

- The increased use of improved meteorological services for decision-making in the agriculture sector will help farmers to better adapt to changing weather conditions, reducing risks to agricultural production and leading to enhanced food security.
- The technical assistance will support the targets for the Agriculture, Forestry and Land Use (AFOLU) sector articulated in Nepal's Nationally Determined Contribution (NDC), as it will test a customized set of weather forecast products for smallholder farmers for increased access to climate-smart agricultural technologies.
- Additionally, the project will strengthen and establish Public Weather Services (PWS), which falls under the country's key policy priorities on adaptation.

|Pakistan|	**| Adaptation|**	**| Piloting and deployment of technologies in local conditions |**	**|National Systems of Innovation |**

Improving adaptive capacities of water sector through surface rainwater harvesting technology adoption

Output:

- The objective was to develop a blueprint for action at the local level for the uptake of the best rainwater harvesting technologies, centered around a water-filled barrier, and management model by identifying the most appropriate rainwater harvesting system and developing a locally led technology transfer action plan for deployment of the rainwater harvesting system in a selected area in Pakistan.

Expected impact and/or follow-up action:

- It is expected that climate resilience in the water sector at the local level in Pakistan would be enhanced through the deployment of the rainwater harvesting system planned through the TA as well as through capacity building of local government bodies and communities in the selected area.

|South Africa|	**| Adaptation |**	**| Governance and Planning|**	**|National Systems of Innovation |**
Tree Monitoring for Climate Adaptation in the City of Mbombela (Pro-bono K)			

Output:

- The city requires assistance in developing a GIS-based tree monitoring system or tool to monitor tree growth over time and to quantify carbon sequestration. This would accompany the planting of trees in rural areas, housing projects, along streets and in parks. The city is also requesting support in establishing municipal nurseries to supply trees.

Expected impact impact and/or follow-up action:

- This type of system would facilitate tree planting and give the city the ability to monitor trees and track growth, tree health and carbon storage over time. Most households and food gardens are owned and managed by women, who would therefore be direct beneficiaries of the program since they are paid stipends to plant trees. There are a multitude of cross-cutting benefits to biodiversity, livelihoods and food provision from additional fruit trees. The city would also benefit culturally from the sharing of indigenous knowledge with the project team on tree species types and observations regarding ecological and tree species changes over the years.

|Sudan|	**| Adaptation |**	**| Piloting and deployment of technologies in local conditions |**	**|Digitalization |**
Soil erosion valuation to support climate resilient agriculture and food security			

Output:

- The primary objective is to strengthen Sudan's capacity to manage soil erosion and enhance agricultural productivity by employing advanced soil analysis techniques and drone Earth Observation-based monitoring.
- The project aims to improve the understanding of soil health and its role in supporting climate resilient agriculture

Expected impact and/or follow-up action:

- The project enhances soil health by providing detailed assessments of soil erosion in Sudan and its impact on crop productivity. This helps targeted interventions to improve soil conservation and management, thereby increasing agricultural resilience to climate change.
- By using advanced soil analysis and Earth Observation tools, the project supports sustainable land management practices that reduce erosion and degradation, improves the quality of soil and thereby enhances the long-term viability of agricultural lands. The project increases agricultural productivity by providing farmers with the information and tools needed to manage soil resources effectively, leading to better crop yields and food security

|Sudan|	**| Adaptation |**	**| Piloting and deployment of technologies in local conditions |**	**|National Systems of Innovation |**

Strengthening the community-based flood and drought preparedness and early warning system in Sudan using operational and innovative models in addition to Satellite-based transmission technology for real-time automatic water level telemetry system (AFCIA)

Output:

- The proposed technical assistance aims to enhance the Flood Early Warning System (FEWS) established by the Eastern Nile Technical Regional Office (ENTRO), which serves Egypt, Ethiopia, South Sudan, and Sudan. The enhancements will make the system more suitable for flood management in Sudanese national sub-basins, enabling Sudanese authorities to better prepare for and respond to upcoming floods,

thereby increasing the resilience of communities, infrastructure, and economic investments.

Expected impact and/or follow-up action:

- Assess the existing Flood Early Warning System (FEWS) of ENTRO, including current protocols, procedures, and the institutional framework available to Sudan.
- Expand and enhance the FEWS components, utilizing available data to increase coverage, efficiency, and lead time in the Setit/Atbara, Dinder, and Rahad national sub-basins.
- Train system operators and build the capacity of a broader range of national FEWS product end users to maximize benefits for the country's disaster management framework.
- Host the system for two years, allowing the Ministry to acquire and install their own hardware, facilitating the transfer of the system to their premises.

B. Technical Assistance: Buildings & Resilient Infrastructure

|Bangladesh|	**| Adaptation |**	**| Decision-making tools and/or information provision|**	**|Digitalization|**

Enhancing longer lead-time flood forecasting and strengthened community dissemination in Bangladesh (Pro-bono K)

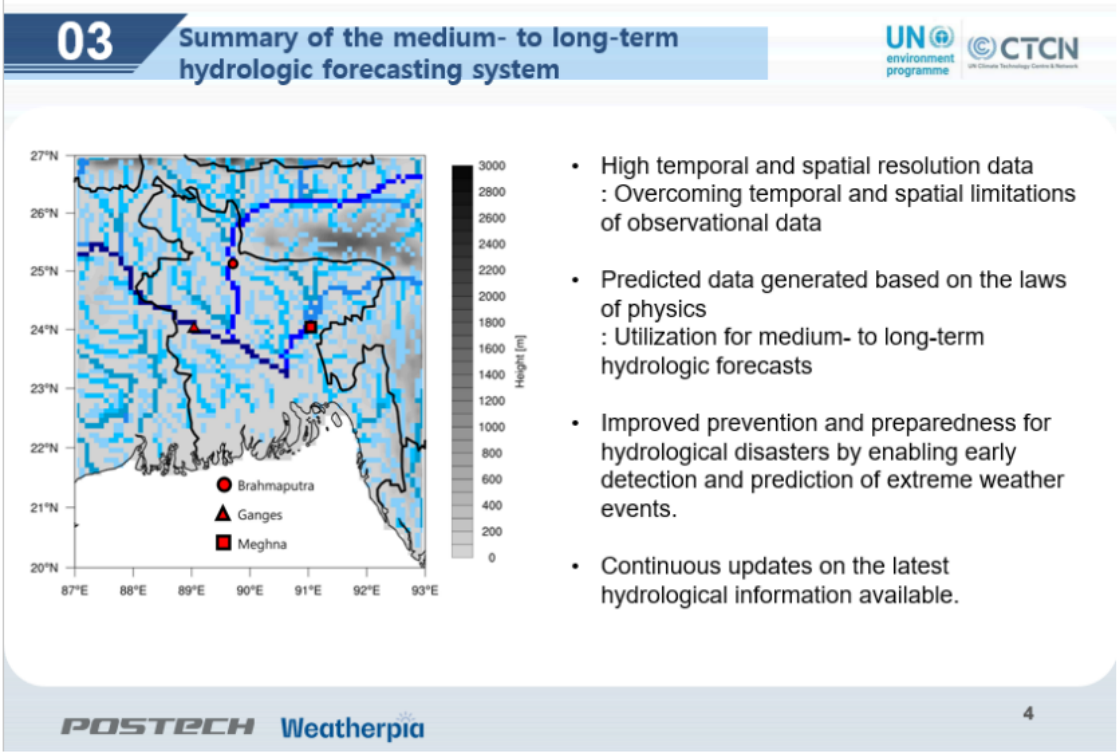
The Bangladesh Water Development Board's (BWDB) Flood Forecasting and Warning Centre (FFWC) aims to improve flood forecasting and early warning systems to better support flood management and community preparedness.

Output:

- The project aims to enhance FFWC's flood forecasting capacity by improving the CFAB modelling technique, incorporating advanced data acquisition and forecasting methods.
- It also seeks to expand seasonal hydrological outlooks for the Meghna River and improve flood forecasting dissemination through ICT, with features like voice message broadcasting, SMS, and email services.
- Capacity-building training will be provided to local disaster management stakeholders to improve the interpretation and application of forecasts and warnings.

Expected impact and/or follow-up action:

- Mitigation of flood and drought risks
- Improvement of food security and livelihoods
- Anticipated increased economic, health, well-being, infrastructure and built environment, and ecosystems resilience to climate change impacts as a result of technical assistance. "Infrastructure and build environment", as well as "Health and wellbeing" Is expected to be increased



|Pakistan|		Mitigation		Economics and financial decision-making, Governance and planning|	|National Systems of Innovation|

Adoption of green buildings in Pakistan to achieve Pakistan's Nationally Determined Contribution

Output:

- Cooperation on establishment of Pakistan green building system
- Follow-up on support projects related with green building in Pakistan (now preparing MoU with Pakistan Company)
- Conducting related knowledge sharing workshops and area expansion studies (Pakistan World Bank, etc.)

Expected impact and/or follow-up action:

- Strengthening flood and disaster response with green building standards and implementation
- Enhance biodiversity with green spaces that take into account local ecosystems
- Leading the way for neighboring countries by boosting green building projects
- Improving health by making people's living spaces more comfortable

|Samoa|		Adaptation, Mitigation		Recommendations for law, policy and regulations		Digitalization	
Developing a framework and methodology to carbon sinks from the forestry sector using Earth observation in Samoa			
To ensure the success of forest mapping and carbon sink projects using REDD+ mechanisms, it is crucial to establish clear legal frameworks, comply with international standards, and develop supportive policies. **Output:** • Producing practical technical guidelines for land cover classification and estimation of forest carbon potential using spatial analysis for practitioners • Producing forest and land use information using field surveys and remote sensing, and developing spatial information-based forest carbon estimation technology • Building the foundation for developing a framework for sustainable forest management and monitoring changes in forest carbon stocks (including building capacity to conduct MRV) • Analyzing REDD+ policy and technical readiness and estimate carbon reduction potential • Producing policy recommendations for developing a framework for sustainable forest management **Expected impact and/or follow-up action:** • The main output of this TA; technical guidelines and policy framework will contribute to the facilitation of the policy implementation in the field and could also help practitioners in the field to be equipped with practical knowledge and know-how on how to process advanced earth observation data **Matchmaking/twinning/study trip:** • The Samoa delegation visited the GCF HQ in Songdo as a matchmaking trip. A workshop also covered forest carbon management, REDD+ MRV assessments, and climate information services for resilient development planning			

Fig. 2. Collecting soil samples using soil core sampler

|Solomon Islands|	**| Adaptation |**	**| Recommendations for law, policy and regulations|**	**|National Systems of Innovation|**

The establishment of an Integrated Coastal Zone Management (ICZM) Plan to protect the mangroves through Ecosystem based adaptation solutions

This technical assistance supported the formulation of an ICZM policy framework to protect mangroves through ecosystem-based adaptation solutions. Over the longer term, the framework aims to balance environment, socio-economic, cultural, and recreational objectives; reduce ecosystem degradation; conserve and maintain existing ecosystems; and involve local communities or stakeholders in sustainable environmental management decisions.

Output:

- The main objective of the TA was to provide Solomon Islands with a clear strategy and direction to establish an Integrated Coastal Zone Management (ICZM) Policy Framework, Implementation Guideline, Technology Factsheets.
- The ICZMP contributes to the climate resilience of the coastal communities in climate change mitigation and adaptation by promoting nature-based solutions supported by 6 identified technological solutions

Expected impact and/or follow-up action:

- Submission of a draft law/policy developed by the CTCN to the cabinet/parliament

RD&D collaboration:

- During the TA, 6 Korean organizations were involved and 2 private sector companies.

Gender considerations:

- Considering women as the main actors for livelihood activities within coastal communities, a participatory ICZMP process enhanced the empowerment of the women groups working in the coastal communities in Solomon Islands

|Tunisia|	**| Adaptation & Mitigation| |**	**| <u>Economics and financial decision-making</u>|**	**|Digitalization |**

Smart drinking water network in Tunisia: first phase in Sousse and Monastir (GCF Readiness)

Output:

- The Smart Drinking Water Network project in Tunisia focused on enhancing water management in Sousse and Monastir by implementing smart monitoring technologies. The project conducted a detailed assessment of the existing water network infrastructure, identifying inefficiencies and areas for improvement. A feasibility study was carried out to evaluate the potential of digital solutions, including real-time leak detection and automated water distribution management. A pilot system was designed and proposed, integrating smart sensors and data analytics to optimize water usage. Additionally, capacity-building workshops were held to train local stakeholders on the operation and maintenance of smart water technologies, ensuring long-term sustainability and improved water security in the region.

Expected impact and/or follow-up action:

- The expected impact of the Smart Drinking Water Network project in Tunisia includes improved water efficiency through real-time leak detection and optimized distribution, reducing water losses and enhancing supply reliability. The implementation of smart monitoring technologies will lead to better resource management, ensuring sustainable water use in Sousse and Monastir. By strengthening the technical capacity of local stakeholders, the project will also contribute to long-term resilience in the face of climate change and increasing water scarcity. Additionally, the initiative is expected to support policy development for scaling smart water solutions nationwide, fostering a more sustainable and digitally integrated water management system.

Connection to TNA:

- The Technology Needs Assessment (TNA) conducted in 2017 paved the way for a Technical Assistance (TA) project focused on piloting a smart metering drinking water network, supported through GCF readiness funding.

|Zimbabwe|		Adaptation & Mitigation		Governance and Planning	|National Systems of Innovation|
Development of Green Building Standards for Zimbabwe	
• **Output:** Zimbabwe is constrained by an inability to fully implement sustainable building practices, adopt environmentally friendly technologies, and put appropriate measures in place to respond to climate change requirements. This is largely attributed to a lack of institutional and financial resources. Zimbabwe needs to develop sustainable building practices, there is a need to improve the environmental and economic performance of new and existing commercial, office, and residential buildings. This technical assistance developed an effective green building standards, policy guidelines and MV&E frameworks in order to introduce sustainable building practices nationwide. **Expected impact and/or follow-up action:** • Dependent on eventual implementation of the GBS, the main anticipated impacts from this TA focus on: • Energy demand reduction • GHG emissions reduction	

C. Technical Assistance: Sustainable Mobility

D. Technical Assistance: Energy Systems

|Lebanon|		Mitigation		Sectoral roadmaps and strategies	|Digitalization|
GREEN CLIMATE FUND Development and implementation of an efficient appliance strategy	
Output: • In Lebanon, a strong system for energy-efficiency evaluation and standards did not exist. The country therefore sought assistance for the development of an appliance and electrical equipment energy-efficiency strategy to decrease national energy consumption. **Expected impact and/or follow-up action:** • Development of a strategy for standards and labels • Development of a strategy to implement and enforce minimum energy performance standards (MEPS) for four priority appliances • Assist in developing a financing mechanism/incentive for the deployment of energy efficient equipment • Propose an awareness plan to reach the end-user properly and effectively • Assist the Lebanese Center for Energy Conservation in applying for international funds in order to implement the strategies	

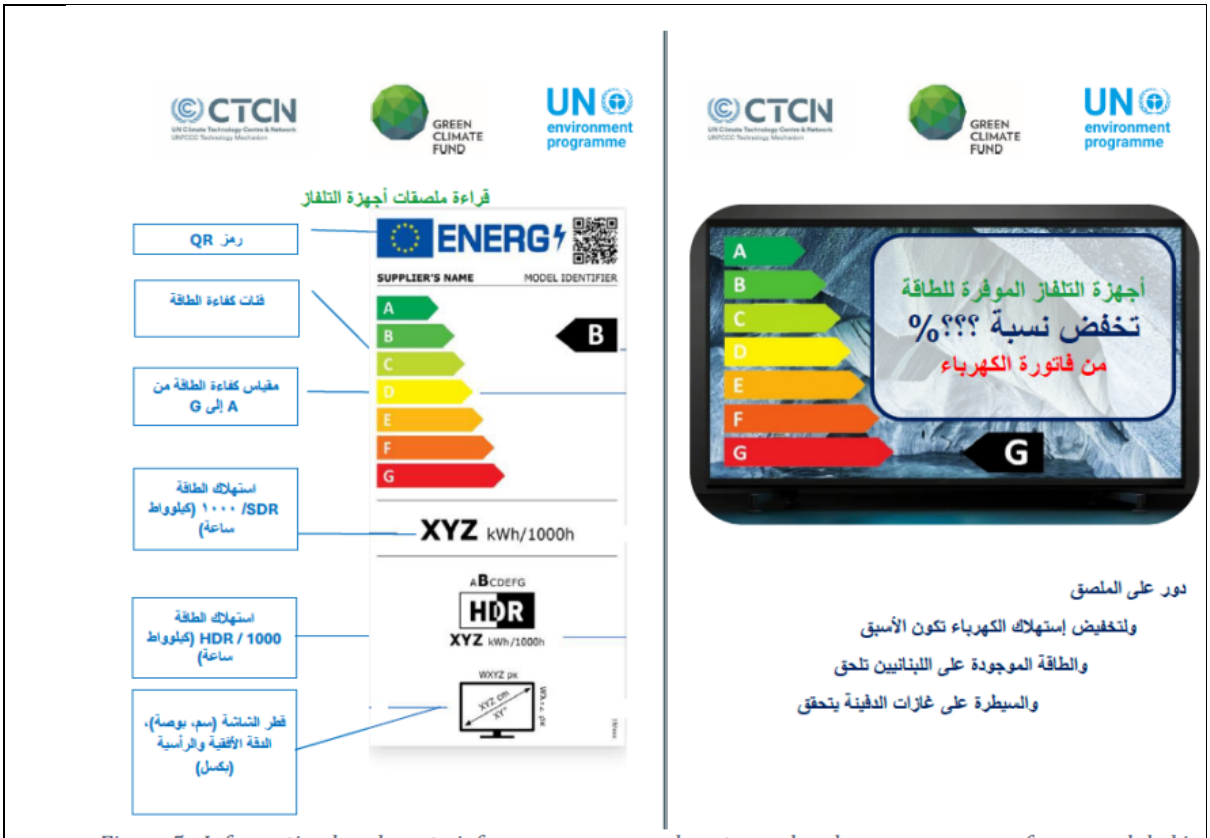


Figure 5 - Information brochure to inform consumers on how to read and use an energy performance label in Arabic.

|Mongolia|	**| Adaptation & Mitigation |**	**| Feasibility of technology options|**	**|National Systems of Innovation|**

Feasibility study of a combined heat and power supply using green hydrogen (Pro-bono J)

Output:

- This feasibility study aimed to assess possibilities of green hydrogen production using electricity from renewable energy farms already in operation in Mongolia, to be transferred and used for hydrogen fuelled gas turbine for cogeneration of heat and power supply, for which at present investigation is still needed.
- Surveys on green hydrogen production, green hydrogen transportation, and green hydrogen utilization were conducted.

Expected impact and/or follow-up action:

- Promote the use of domestically produced energy that does not emit CO^2 and air pollutants by introducing a system for the production, storage, transportation, heat and power supply of green hydrogen in Mongolia.

|Nigeria|	**| Mitigation |**	**| Capacity building and training**	**|Digitalization|**

		Governance and Planning |	

Developing an Institutional Framework for the Energy Efficiency Act and Regulations targeting energy intensive sectors (households and industries) in Nigeria

Output:

- The objective is to develop a harmonized framework of regulations that instigate adoption and implementation of energy efficient technologies and practices in the industrial, commercial and transport sectors. The technical assistance will also support the development of an institutional structure to monitor and report on activities undertaken toward compliance with the regulations.

Expected impact and/or follow-up action:

- The developed harmonized framework of regulations will facilitate the adoption and implementation of energy efficient technologies and practices in the industrial and household sectors, bolstered by a monitoring and evaluation framework to track compliance.
- This project will contribute to the achievement of Nigeria's NDC, which prioritizes an economy-wide energy efficiency as a key mitigation measure, with a potential GHG reduction of 179 million tonnes per year in 2030. Nigeria has specifically targeted energy efficiency to reduce overall energy demand and increase the efficiency of existing vehicles and the transport system.

|Thailand|	**| Mitigation |**	**| Economics and financial decision-making|**	**|National Systems of Innovation|**

Development of national hydrogen strategy and action plan for accelerating Thailand's net-zero target

Output:

- Commercial hydrogen producers in Thailand are still limited, and currently most production is grey hydrogen with gas pipeline, tube trailer, and cylinders/cylinders pack as mode of transportation. Thailand will be able to use a wide variety of bio resources as fuels, such as bioethanol and biogas. With the available infrastructure, these resources could have the potential to enable large-scale hydrogen production in Thailand
- The objective is to provide a clear strategy to utilize green hydrogen technologies to achieve Thailand's net-zero goal.

Expected impact and/or follow-up action:

- This technical assistance will enhance economic activities, especially in the mobility and automotive sectors, given that green hydrogen and other related clean technologies might be the new growth driving factors in Thailand. Additionally, the

agriculture sector, which contains large rural households, could benefit from green hydrogen produced using bio resource technologies.

E. Technical Assistance: Business & Industry

|Cambodia|	**| Adaptation & Mitigation |**	**| Governance and planning |**	**|National Systems of Innovation|**
Market assessment in the application of climate technologies in the agriculture sector for rural development in Cambodia			

Output:

- Identify and prioritize climate technologies suitable for Cambodia's agriculture sector to support rural development and align with Nationally Determined Contributions (NDCs), fostering technology adoption through stakeholder networks.

Expected impact and/or follow-up action:

- Understanding current status on SMEs in target sectors in Cambodia and raising awareness on the uptake of ESTs by SMEs.
- Recommendation on innovative financial instruments tailored to the adoption of climate and EST technologies.

|Pakistan|	**| Adaptation & Mitigation|**	**|Feasibility of technology options|**	**|National Systems of Innovation|**

Technologies Framework for Implementation of Nationally Determined Contributions for Pakistan
Output: • The Technical Assistance is aimed at the development of Pakistan Technology Roadmap for NDC Implementation in Waste and Water sectors, ensuring the integration of sustainable technologies to achieve climate and development goals. • Improved stakeholder communication and coordination through the formation of Technology Roadmap Coordination Mechanisms • Water and Waste sector analyses, and sectoral technology identification and assessments • Develop Technology Roadmap for NDC implementation • Gender, youth integration **Expected impact and/or follow-up action:** • In achieving intended NDC mitigation and adaptation impacts in the waste and water sectors respectively, a sector analysis and technology identification will guide the strategic building of capacity and technology adoption along with priority steps within the Technology Roadmap. Gender and youth integration will ensure maximised socio economic co-benefits in terms of access to benefits such as emission mitigation , health improvement, jobs and environmental resilience. • Pakistan Technology Roadmap for NDC implementation for Waste and Water sectors • Submission of a draft law/policy developed by the CTCN to cabinet/parliament. **South-South Collaboration:** • Through this TA, the Federal Flood Commission Pakistan, the Pakistan Council of Research on Water Resources and the National Rural Support Programme started collaborating.

|South Africa|	**| Adaptation & Mitigation |**	**| Capacity building and training|**	**|National Systems of Innovation|**
Developing an STI-led cross-sectoral Circular Economy Roadmap for abating GHG emissions in South Africa			
The technical assistance (TA) builds upon an initial TA conducted in 2019, aimed at assisting municipalities and other decentralized administrations in integrating circular economy principles into their budgetary planning processes. As a result of this effort, a step-by-step guide has been published to help municipalities implement circular economy approaches in their planning and budgeting activities. **Output:** • Development of the National Circular Economy Strategy, starting with the establishment of the Intersectoral Technical Committee on Circular Economy			

- Publication of the National Circular Economy Strategy

Expected impact and/or follow-up action:

- Both the Circular Economy Fiscal Policy and Law proposals are under public consultation.
- A project is in design to generate an index of circularity potential at the local government and municipality level.

|Zambia|	**| Adaptation & Mitigation |**	**| Governance and Planning |**	**|National Systems of Innovation|**
Development of Green Building Standards for Zimbabwe			

- **Output:**
  This TA enhanced a National Innovation System (NIS) to foster low-carbon and climate resilient economic development in Zambia with the following activities: • Assessment of the national innovation environment for climate action. • Development of a framework and implementation roadmap for the establishment of a NIS • Introduction of innovation support agency and identification of funding and cooperation opportunities Development of an innovation communication and capacity building strategy and plan and concept of a web-based platform

Expected impact and/or follow-up action:

CI 2: Anticipated increased policy infrastructure and built environment resilience to climate change impacts as a result of TA. This will be assessed by the quality of a policy framework, roadmap for an effective NIS with the improvement of communication strategy • Enhancement of institutional capacity to coordinate innovation activities • Contribution to achieving the NDC target of Zambia • ≥100 direct and indirect beneficiaries as a result of the TA

Establishing a foundation for enhancing institutional innovation support through the proposal of appropriate funding allocation and utilization strategy.

F. Technical Assistance: Technology Needs Assessments

|Chile|	**| Mitigation, Adaptation |**	**| Technology identification and prioritization |**	**|National Systems of Innovation|**
Technology Needs Assessment (TNA) and Technology Action Plan (TAP) for Chile's NDC implementation			

Since 2015, a TNA has been part of Chile's NDC and in 2018 the country took the first steps in this process, resulting in the prioritization of three sectors: water resources; forestry; and energy.

A fourth sector, the waste management sector, was included in 2020 due to the growing importance in recent decades in the total national GHG emissions' mix.

With the assistance of the CTCN, the country completed the TNA process through the identification of technological solutions for the prioritized sectors, the development of a Technology Action Plan by challenge, sector and/or subsector and ensured national ownership and technological deployment. One Concept Note was developed: "Complete Early Warning Systems in Ñuble – Biobío".

As part of the project, the CTCN conducted three national workshops for government officials, academia, NGOs and the private sector, to ensure national ownership and deployment of the TAPs. The results from the TNA, which include four technology action plans, are being integrated into the 17 sectoral plans that make up Chile's Climate Change Law.

Output of the updated TNA:

Technology Prioritization

Energy Sector: • Batteries, • Bus Rapid Transit, • Heavy-duty vehicles with green hydrogen	**Water resources:** • Rainwater harvesting, • Wastewater reuse, • Machine learning for the detection and location of leaks in water distribution networks
Waste Management: • Community Vermicomposting of municipal organic waste, • biological treatment using black soldier fly larvae, • Anaerobic digestion to produce biogas and electricity	**Forestry and agriculture:** • Intelligent Irrigation System, • Early Warning Systems, • Machine learning to optimize the performance of agricultural and forestry activity