Detailed Workplan and Related Documents under Output 1

Pakistan Technology Roadmap for NDC implementation

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1 Detailed Workplan

This workplan details all the activities that will be carried out in the development of the Technology Roadmap for NDC implementation of Pakistan. The Technical Assistance (TA) is implemented by the Global Green Growth Institute (GGGI).

Project information

Partners Name: Global Green Growth Institute (GGGI)

Budget line: SB-000900.30.01.11; M1-32CLL-000011

Reference number: CTCN 23-004

Amount: US$ 248,975

POW 2023-2027

Sub-programme: 1626 CTCN

Expected Accomplishment(s): Development of Pakistan Technology Roadmap for NDC Implementation

Output(s): 1-5 as per Agreement

Title of the approved PRC project: Pakistan Technology Roadmap for NDC Implementation

SSFA/PCA starting date: 01/05/2023

Organization

1.1.1 General information

The table below shows an overview of the key outputs and deadlines as outlined in the approved Response Plan.

Table 1 Outputs and delivery dates

Activity	Description of work undertaken during reporting period	Delivery date
Output 1	Development of Response Plan and implementation planning and communication documents	
Activity 1.1	1.1. Response Plan	30-Jun-23
	1.2 Implementation Plan	31-Jul-23

	1.3 Monitoring and Evaluation plan	31-Jul-23
	1.4 Impact description	31-Jul-23 31-Jul-24
	1.5 Closure and data collection report	31-Jul-24
Output 2	Technology Roadmap Coordination Mechanisms	
Activity 2.1	2.1 Establishing a coordination mechanism	30-Aug-23
Activity 2.2	2.2 Regular TRC meetings	1-Aug-23
Activity 2.3	2.3 Regular MTC and ATC meetings	30-Sep-23 31-Dec-23 31-Mar-24 30-Jun-24
Output 3	Output 3: Identification of climate technologies for intervention in the high-impact sectors of waste management and water	
Activity 3.1	3.1a Analysis of waste sectors and identification of technologies	30-Sep-23
Activity 3.1b	3.1b Analysis of water sectors and identification of technologies	30-Sep-23
Activity 3.1a2	3.2a Assessment of identified waste technologies	31-Dec-23
Activity 3.1a3	3.2b Assessment of identified water technologies	31-Dec-23
Output 4	Output 4: Development of technology roadmap for NDC implementation	
Activity 4.1	4.1 Development of an NDC technology roadmap for identified sectors	30-Jun-24
Output 5	Output 5: Preparation of Financing Support	
Activity 5.1	5.1 Two funding concept ideas, including two GCF concept notes	31-Jul-24

1.1.2 Team composition with Roles and functions

The table below presents the names of GGGI team members and their main functions. Additionally, the table shows the functions of a consultancy Firm, which,at the time of writing this report, is still being procured.

Table 2 Team and function

Organization	Name	Acronym	Function
GGGI	Ingvild Solvang	IS	International Team lead whose functions are the direct, supervise and enforce the Terms of Reference of the project. IS will also direct and oversee the work to integrate gender and youth issues into the Technology Roadmap.
	Ankit Bhatt	AB	International Waste Expert whose functions are to provide the expert knowledge required to direct, oversee and develop the technology analysis, identification and assessment in the waste section, and to transfer knowledge and leading technical discussions with the national Waste Committee and Technology Roadmap Committee focused on waste.
	Michael Bak	MB	International Water Expert whose functions are to provide the expert knowledge required to direct, oversee and develop the technology analysis, identification and assessment in the water section, and to transfer knowledge and leading technical discussions with the national Water Committee and Technology Roadmap Committee focused on water.
	Dereje Senshaw	DS	International Renewable Energy expert whose functions are to provide the expert knowledge required to direct, oversee and develop the analysis of renewable energy as a cross cutting sector in the development of the Technology Roadmap, and to transfer knowledge and leading technical discussions with the national Water Committee and Technology Roadmap Committee focused on renewable energy.
	Gulshan Vashistha	GV	Global Investment Services expert whose functions are to provide the expertise and knowledge required to direct, oversee and develop concept notes for financial support in waste and water sectors, while transferring knowledge to national institutions.
[Firm logo]	Firm	Firm	National Waste Policy and Technology Expert is responsible for the national and sub-national level stakeholder engagements related to the work in the waste sector and will provide expertise inputs and technical assessment to ensure that the Roadmap is firmly embedded in the national context and owned by national stakeholders.

	Firm	Firm	National Water Policy and Technology Expert is responsible for the national and sub-national level stakeholder engagements related to the work in the waste sector and will provide expertise inputs and technical assessment to ensure that the Roadmap is firmly embedded in the national context and owned by national stakeholders.
	Firm	Firm	National Gender Expert will ensure the assessment and analysis required to ensure that the Roadmap integrates gender, youth and social inclusion perspectives to maximize socio-economic cobenefits.

1.1.3 Logistical aspects

Agreement with MoCC, CTCN and other stakeholders will be reached latest at the Kick-off workshop, agreement will be reached on logistical aspects of communication, frequency of meetings, and deadlines for review of deliverables:

Communication– For communication, the people who will be focal points of communication will be Ingvild Solvang, as International Team Lead.

Regular meetings– Regular meetings will be agreed during the Kick-off meeting, currently scheduled for August.

Deliverables– The deliverables will be sent to the CTCN focal point, as well as to the national focal points (Details Table 1). The national focal points will consolidate their comments and submit them as a review document. The established review time was set at [To be agreed] business days.

Workplan

1.1.4 RASCI Matrix

To clarify roles and responsibilities, a RASCI Matrix has been developed along side the outputs and activities of the TA outlined in the Response Plan. The acronym RASCI stands for "Responsible, Approving, Supporting, Consulting and Informed.

- Responsible: person who completes the task.
- Approver: person who makes decisions and carries out actions on the task(s).
- Supporter: person who supports actions and decision making.
- Consulted: person to whom it will be communicated through the decision-making process and specific tasks.
- Informed: person who will be updated on decisions and actions during the project.

Table 3 RASCI Indicator

R	Responsible
A	Approver
S	Supporter
C	Consulted
I	Informed

Table 4 RASCI Matrix

No	Activities	IE 3: Team Lead	IE 1: Waste	IE 2: Water	IE 4: RE	IE 6: GIS	NE1 Waste	NE2 Water	NE3 Gender
	Professionals	IS	AB	MB	DS	GV	Firm	Firm	Firm
	Output 1: Development of Response Plan and implementation planning and communication documents								
	1.1. Response Plan	R	C	C					
	1.2 Implementation Plan	R	C	C					
	1.3 Monitoring and Evaluation plan	R	C	C			S	S	S
	1.4 Impact description	R	C	C			S	S	S
	1.5 Closure and data collection report	R	C	C			S	S	S
	Output 2: Technology Roadmap Coordination Mechanisms								
	2.1 Establishing a coordination mechanism	R	S	S	C	C	S	S	S
	Kick off workshop	R	*S*	*S*	*C*	*C*	*S*	*S*	S
	2.2 Regular Technology Roadmap Committee meetings	S	S	S	C	C	R	R	S
	2.3 Regular Waste Committee and Water Committee meetings	S	S	S	C	C	R	R	S
	Output 3: Identification of climate technologies for intervention in the high-impact sectors of waste management and water								
	3.1a Analysis of waste sectors and identification of technologies	A	R	I	S	C	I	S	S
	3.1b Analysis of water sectors and identification of technologies	A	I	R	S	C	S	I	S
	3.2a Assessment of identified waste technologies	A	R	I	S	C	I	S	S
	3.2b Assessment of identified water technologies	A	I	R	S	C	S	I	S

	Output 4: Development of technology roadmap for NDC implementation								
	4.1 Development of an NDC technology roadmap for identified sectors	A	R	R	S	S	S	S	S
	Output 5: Preparation of Financing Support								
	5.1 Two funding concept ideas, including two GCF concept notes	A	S	S	S	R	S	S	S

1.1.4.1 Gantt Chart

Table 5 Gantt Chart

No	Activities	Responsible	Condition	Start Date	Finish date	2023								2024							
						May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
	Output 1: Development of Response Plan and implementation planning and communication documents																				
	1.1. Response Plan	IS	In process	30-May-23	30-Jun-23																
	1.2 Implementation Plan	IS	In process	30-May-23	31-Jul-23																
	1.3 Monitoring and Evaluation plan	IS	In process	30-May-23	31-Jul-23																
	1.4 Impact description	IS	In process	30-May-23	31-Jul-23 31-Jul-24																
	1.5 Closure and data collection report	IS	In process	30-May-	31-Jul-24																

				23																	
	Output 2: Technology Roadmap Coordination Mechanisms																				
	2.1 Establishing a coordination mechanism	Firm		1-Aug-23	30-Aug-23																
	Kick off workshop	*IS/MoCC*	*In process*	1-Aug-23	1-Aug-23																
	2.2 Regular Technology Roadmap Committee meetings	Firm		1-Aug-23	30-Sep-23 31-Dec-23 31-Mar-24 30-Jun-24																
	2.3 Regular Waste Committee and Water Committee meetings	Firm		1-Aug-23	30-Sep-23 31-Dec-23 31-Mar-24 30-Jun-24																
	Output 3: Identification of climate technologies for intervention in the high-impact sectors of waste management and water																				
	3.1a Analysis of waste sectors and identification of technologies	AB		1-Sep-23	30-Sep-23																
	3.1b Analysis of water sectors and identification of technologies		MB	1-Sep-23	30-Sep-23																
	3.2a Assessment of identified waste technologies	AB		1-Sep-23	31-Dec-23																
	3.2b Assessment of identified water technologies		MB	1-Sep-23	31-Dec-23																

	Output 4: Development of technology roadmap for NDC implementation																				
	4.1 Development of an NDC technology roadmap for identified sectors				30-Jun-24																
	Output 5: Preparation of Financing Support																				
	5.1 Two funding concept ideas, including two GCF concept notes				31-Jul-24																

1.1.4.2 Planning of committee meetings, workshops, and consultations

The work to develop a Technology Roadmap has a high consultation component. Planning of committee meetings, workshops and other consultation is therefore pivotal for successful coordination between stakeholders and smooth implementation. All workshops and save-dates will be planned with the national technical counterpart. GGGI, the recruited Firm and MoCC will jointly detail the technical and logistical aspects, and this will be done in good time ahead of each workshop. Workshop and meeting planning will be put on the agenda for the Kick-off workshop; however, the main activities are proposed in the table below.

Format	Target participants	Purpose	Dates
In-person/virtual	MoCC, technical focal points and committee members	Kick-off Meeting to agree on vision for the technology road map and work plan and process. May include presentation of sample technology roadmap and methodology.	September 15, 2023
Virtual	Technology Roadmap Committee members	Overall oversight of project implementation.	September 30, 2023 May 30, 2024
In-person/virtual	Waste Technology Committee	Technical oversight of the water sector work	30-Sep-23 31-Dec-23 31-Mar-24 30-Jun-24
In-person/virtual	Water Technology Committee	Technical oversight of the water sector work	30-Sep-23 31-Dec-23 31-Mar-24 30-Jun-24
Virtual	All technology members	Verification meeting with presentation of preliminary findings for inputs.	June 13, 2024

Risk Management

Potential risks that might cause challenges, delays or changes to the implementation of the Response Plan are anticipated, analyzed, and presented in this section. A 9-point scale has been applied to assess the probability and severity of each risk to support the prioritization of risks and assignment of mitigation strategies.

Likelihood				
	High	4	2	1
	Med-ium	7	5	3
	Low	9	8	6
		Low	Medium	High
		Severity		

Risk	Impact	Likelihood	Severity	Risk Level	Mitigation plan	Responsible
Low availability/ motivation from stakeholders to participate in the process	Delays caused and ineffective use of time and resources	Medium	High	3	Close communication and coordination with MoCC and national stakeholders	International Team Leader
Turn over of stakeholders due to political and government changes	Challenges to identify key stakeholders to engage in the process and drive required decision making	Medium	High	3	Close communication and coordination with MoCC	International Team Leader
Unclarity about water and waste subsectors, approaches, and specific sector challenges	Low levels of ownership of the Technology Roadmap results in low impact of the work for the country's NDC implementation	Low	High	6	Close coordination and engagement of national experts and government counterparts	International Waste and Water Specialists
Lack of data availability	Challenges in identifying impactful technologies and verify conclusions	Medium	Medium	5	Close coordination and engagement of national experts and government counterparts	International Waste and Water Specialists
Difficulties in coordination with the NDE	Delays in implementation	Low	Medium	8	Assign clear roles and responsibilities, and appoint focal person	International Team Lead

2 Monitoring and Evaluation Plan

Basic Information	
Title of response plan	**Pakistan Technology Roadmap for NDC Implementation**
Technical assistance reference number	CTCN 23-004
Country/ countries	**Pakistan**
NDE focal point and organisation	Dr Saima Shafique, Ministry of Climate Change (saimashafique76@hotmail.com)
Sector(s) addressed	**Waste and Water sectors**
Technologies supported	Subject to assessment
Implementation period and total duration	01/05/2023 – 01/07/2024 (15 months duration)
Total budget for implementation	US$ 248,975
Designer of the response plan	MoCC
Implementer of response plan	**Global Green Growth Institute**

(A) Outputs and Activities as described in the Response Plan	(B) Indicator	(C) Expected results	(D) Method and frequency for data collection	(F) Comments
Output and activities as stated in Response Plan.	*Select relevant indicators from the Closure Report (at least one core indicator, section B). You may also define additional relevant indicators to be added.*	*Add the expected quantitative or qualitative target/value of the indicator (e.g. number of studies, policy recommendations, etc.).*	*Describe the expected method and frequency for data collection (e.g. survey, head count at a training workshop, application of*	*Describe any assumptions made or anticipated challenges for collecting quantitative and qualitative data*

			a standard methodology etc.)	
Impact level: Pakistan achieves its NDC targets for water and waste sectors	*a)* CTCN core indicator: Anticipated metric tons of CO2 equivalent (CO2e) emissions reduced or avoided as a result of CTCN TA (disaggregated by annual and total) *b)* CTCN core indicator: Amount of funding/investment leveraged (USD) as a result of TA (disaggregated by public, private, national, and international sources, as well as between anticipated/confirmed funding)	a) Xxx metric tons of CO2 as per NDC for water and waste b) Estimated investment targets from one concept note for water and one concept note for waste (output 5)	*CTCN definition of the two indicators will be applied*	*Assumptions:* a) The Technology Roadmap resulting from the TA is adopted and implemented by the government. b) Two concept notes under output 5 are financed and implemented
Output 1: Development of Response Plan and implementation planning and communication documents	a) Number of deliverables produced – (Number of tools and technical documents reinforced, revised or developed)	Total: 5 deliverables • Revised Response Plan approved • Implementation plan • M&E plan • Impact description (final version) • Closure and Data Collection Report at tend of TA	Methodology: Plans will be prepared at the start of the TA and completed at the end.	CTCN templates are used when available
1.1. Response Plan	Number of deliverables produced	Total 1 deliverable: an updated Response plan is approved by MoCC and	Methodology: information and data	CTCN template used

		CTCN at start of project	prepared at the start of the TA	
1.2 Implementation Plan	Number of deliverables produced	Total 1 deliverable	Methodology: information and data prepared at the start of the TA	GGGI template used
1.3 Monitoring and Evaluation plan	Number of deliverables produced	Total 1 deliverable	Methodology: information and data prepared at the start of the TA	CTCN template used
1.4 Impact description	Number of deliverables produced	Total 2 deliverables • Initial version • Final version	Methodology: information and data prepared at the start of the TA and updated at the end	CTCN template used
1.5 Closure and data collection report	Number of deliverables produced	Total 1 deliverable	Methodology: information and data prepared at the start of the TA and updated at the end	CTCN template used
Output 2: Technology Roadmap Coordination Mechanisms	a) Number of deliverables produced – (Number of tools and technical documents reinforced, revised or developed) b) Number of meetings held	Minimum of seven (7) and up to twelve (12) meetings held: • Technology Roadmap committee (2) • Waste Technology Committee (Min. 2, up to 4) • Water Technology Committee (Min. 2, up to 4)	Methodology: participants identified with MoCC. Committee TORs developed with stakeholders. Meeting TORs developed in consultation	Technical oversight and high-level coordination with Technical Roadmap Committee and sector level Technology Committees will be ensured by MoCC

		• Kick off workshop (1)	with MoCC and stakeholders.	
2.1 Establishing a coordination mechanism	a) Number of events organized with stakeholders b) Percentage of men and women participants	a) Xx events b) 50% women participants	Methodology : participants identified with MoCC. Committee TORs developed with stakeholders. Meeting TORs developed in consultation with MoCC and stakeholders.	MoCC will ensure coordination with government stakeholders
Kick off workshop	a) Number of events organized with stakeholders b) Percentage of men and women participants	a) Xx events b) 50% women participants	Methodology : participants identified with MoCC. Meeting TORs developed in consultation with MoCC and stakeholders.	MoCC will ensure coordination with government stakeholders
2.2 Regular Technology Roadmap Committee meetings	a) Number of events organized with b) Number of meeting reports	Minimum of two, but up to four, meetings held Minimum of two, but up to four, meeting reports delivered	Methodology : participants identified with MoCC. Meeting TORs developed in consultation with MoCC and stakeholders.	MoCC will ensure coordination with government stakeholders
2.3 Regular Waste Committee and Water	a) Number of events organized with b) Number of meeting	Minimum of two, but up to four, meetings held Minimum of two, but up to four, meeting reports	Methodology : participants identified with MoCC.	MoCC will ensure coordination with

Committee meetings	reports	delivered	Meeting TORs developed in consultation with MoCC and stakeholders.	government stakeholders
Output 3: Identification of climate technologies for intervention in the high-impact sectors of waste management and water	Number of deliverables produced Number of tools and technical documents	Total 4 deliverables • Waste sector analysis and technology identification report (with gender, youth issues integrated) • Water sector analysis and technology identification report (with gender, youth issues integrated) • Waste stechnology assessment (with gender, youth issues integrated) • Water technology assessment (with gender, youth issues integrated)	Methodology : prepare a research report and consult/verify the results with key stakeholders. Submit for review and comment by stakeholders.	Technical oversight and high-level coordination with Technical Roadmap Committee and sector level Technology Committees will be ensured by MoCC.
3.1a Analysis of waste sectors and identification of technologies	Number of deliverables produced Number of tools and technical documents	Total 1 document • Waste sector analysis and technology identification report • Gender and youth integration into analysis	Methodology : Coordinate the analysis with the technical committee and ensure quality control, verification, inputs from key stakeholders.	Technical oversight and high-level coordination with Technical Roadmap Committee and sector level Technology Committees will be ensured by MoCC.
3.1b Analysis of	Number of deliverables	Total 1 document	Methodology	Technical

water sectors and identification of technologies	produced	• Water sector and technology identification report • Gender and youth integration into analysis	: Coordinate the analysis with the technical committee and ensure quality control, verification, inputs from key stakeholders.	oversight and high-level coordination with Technical Roadmap Committee and sector level Technology Committees will be ensured by MoCC.
3.2a Assessment of identified waste technologies	Number of deliverables produced	Total 1 document • Waste technologies assessment • Gender and youth integration into assessment	Methodology : Coordinate the assessment with the technical committee and ensure quality control, verification, inputs from key stakeholders.	Technical oversight and high-level coordination with Technical Roadmap Committee and sector level Technology Committees will be ensured by MoCC.
3.2b Assessment of identified water technologies	Number of deliverables produced	Total 1 document • Water technologies assessment • Gender and youth integration into assessment	Methodology : Coordinate the assessment with the technical committee and ensure quality control, verification, inputs from key stakeholders.	Technical oversight and high-level coordination with Technical Roadmap Committee and sector level Technology Committees will be ensured by MoCC.
Output 4: Development of technology roadmap for NDC	Number of deliverables produced Number of deliverables verified by MoCC, key stakeholders	Total 1 document: Technology Roadmap for NDC Implementation	Methodology : apply sector level analysis and assessments and develop	Technical oversight and high-level coordination with Technical Roadmap

implementation			roadmap using CTCN template and in consultation with MoCC.	Committee and sector level Technology Committees will be ensured by MoCC.
4.1 Development of an NDC technology roadmap for identified sectors	Number of deliverables produced	Total one document produced, revised and finalized	Methodology : data and information systematized, consulted and quality assured. Inputs and comments collected from MoCC and key stakeholders before finalized.	Templates by CTCN in consultation with MoCC applied.
Output 5: Preparation of Financing Support	Number of deliverables produced	Total two documents produced • Idea note for waste sector • Idea note for water sector	Based on technology prioritization in the Roadmap (output 4) one idea note prepared per sector, identification of funding sources	Involvement of GGGI Global Investment Services team in consultation with MoCC and sector technology committees
5.1 Two funding concept ideas, including two GCF concept notes	Number of deliverables produced	Two project idea notes produced and verified by key stakeholders and MOCC	Structuring of ideas as preparation for submission to climate financiers	Targeting GCF or other climate financier

3. Impact Description

Note: The Response Plan may contain information useful for the section below. The information in the table below will be used by the CTCN for public communication of the achieved and expected results of the Technical Assistance through the CTCN website www.ctc-n.org and other communication channels. See for example: https://www.ctc-n.org/sites/www.ctc-n.org/files/benin_a_ag_forestry.final_.pdf

Impact Statement	
Challenge	The Technical Assistance is aimed at the development of Pakistan Technology Roadmap for NDC Implementation in Waste and Water sectors. Information from NDC: Waste: Ranked lowest emitting sector in Pakistan that contributed 21.72 MTCO2e to total GHG emissions in 2018. Methane is the primary GHG emitted, with a share of 19.2 MTCO2e. NDC actions: a) Strengthening municipal service delivery by the local governments. Includes a composite index of five pillars i.e., water, sanitation, hygiene, solid waste management and plantation b) Encourage turning animal waste (cow-dung) to methane for use as fuel for rural households and urban transportation projects, as in Karachi BRT. c) Promote reuse and source reduction of waste. Water is a key adaptation priority in the NDC and covers water management, floods and disaster risk, health and WASH, agriculture and irrigation. Specific sub-sectors for waste and water sectors to be addressed in the TA is subject to further assessment and consultation
CTCN Assistance	• 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 • Two concept notes (water and waste respectively) for financing support
Anticipated impact	**In achieving intended NDC mitigation and adaptation impacts in the waste and water sectors respectively, sectoral analyses, technology identification and technology assessments are required to guide the strategic building of capacity and technology deployment. Gender and youth integration will ensure maximised socio-economic co-benefits in terms of access to jobs and services.** *Summarize the problem statement and desired impact. Describe how the TA is expected to lead to the desired impact. Include description of stakeholders, deliverables and timelines. As a minimum, please include at least one of the core impact indicators from the closure report*

	Annex.
Co-benefits: Achieved or anticipated co-benefits from the TA	**Implementation of the Technology Roadmap is expected to generate green jobs and maintain or improve access to waste and water services.** *Instruction: Please indicate expected co-benefits as described in the response plan and in the relevant deliverables*
Gender aspects of the TA	**The Technology Roadmap for NDC implementation will integrate gender and youth, through technical assistance provided by national and international gender experts.** *Instruction: Please indicate if technical assistance was supported by a gender analysis. Describe gender aspects identified and additional considerations taken to mainstream gender (e.g. equal participation in trainings, gathering of gender-disaggregated data, etc.).*
Anticipated contribution to NDC	**The sectors – waste and water – and the technical analysis will be aligned with the NDC.** *2 to 4 bullet points. Approximately 350 characters with spaces*
The narrative story	**To be completed upon completion of the project.** *Approximately 1200 characters with spaces* *Please provide a brief description of the background and context for the technical assistance. Describe the main problems and barriers for climate change mitigation and/or adaptation in terms of climate technologies that the CTCN technical assistance will address*
Contribution to SDGs A complete list of SDGs and their targets is available here: https://sustainabledevelopment.un.org/partnership/register/	**Reduction in GHG emissions in the waste sector through use of low carbon technology and integration of climate change measures in national strategies and planning** **(Contribution to 13: Climate Action 13.2 - Integrate climate change measures into national policies, strategies and planning)** **Strengthening adaptive capacity through climate smart technology in the water sectors** **(Contribution to 13: 13.1 - Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries** *To the extent possible, please describe contribution to approximately 3 SDGs, including SDG13, with a few sentences for each SDG concerned.*

3 Technical Assistance Closure Report Template

Technical Assistance Closure Report Template

Objective of the technical assistance (TA) Closure Report:

- To communicate publicly in one document a summary of progress made and lessons learned during the TA towards the anticipated impact (sections 1-4).
- To document qualitative and quantitative data collected during TA, for use in donor and UN reporting (Annex 1).
-

Steps for completing the TA closure report:

1. The lead TA implementer submits the closure report at the end of the technical assistance as a final deliverable. The TA closure report will capture outputs, outcomes and impacts of all activities conducted under the TA. Please copy and summarise relevant material from previous TA outputs/deliverables and the Response Plan, as relevant.
2. A CTCN Manager will review and revise the closure report before final approval by the CTCN Deputy Director.

Important note on public and internal use of the closure report:

Once approved by the CTCN Deputy Director, the TA closure report will be a public document available on the CTCN website www.ctc-n.org. Selected content will be used for targeted communication activities. Annex 2 is for internal use only and will not be publicly available.

Closure Report for CTCN Technical Assistance

1. Basic information

Title of response plan	**Pakistan Technology Roadmap for NDC Implementation**
Technical assistance reference number	**CTCN 23-004**
Country / countries	**Pakistan**
NDE organisation	**Ministry of Climate Change**
NDE focal point	**Dr Saima Shafique**
NDE contact information	**saimashafique76@hotmail.com**
Proponent focal point and organisation	*Ingvild Solvang, GGGI, ingvild.solvang@gggi.org*

Designer of the response plan	*Ingvild Solvang, GGGI, ingvild.solvang@gggi.org*
Implementer(s) of technical assistance	**Global Green Growth Institute (GGGI)** **Firm (procurement in process)** *Instruction: Implementers and other partner organisations are defined as the people and institutions engaged in the implementation of the TA*
Beneficiaries	**Ministry of Climate Change (MoCC)** *Instruction: Beneficiaries are defined as people and institutions benefitting from the TA*
Sector(s) addressed	Waste and Water – subsectors subject to assessment *Instruction: Select relevant sector(s) from the CTCN taxonomy https://www.ctc-n.org/resources/ctcn-taxonomy*
Technologies supported	Subsectors and technologies are subject to identification. *Instruction: Please indicate the type of technologies supported by this assistance. Technologies may be identified from the CTCN taxonomy of climate sectors and technologies (download in pdf format and choose from column C): https://www.ctc-n.org/resources/ctcn-taxonomy* *If technologies supported are not found in the taxonomy, please suggest.*
Implementation start date	01/05/2023
Implementation end date	*01/07/2024*
Total budget for implementation	**USD 248,974** Instruction: In addition to financial value of the technical assistance, please also include if any pro bono or in-kind support has been provided by either

	the implementer and/or the national counterparts.
Description of delivered outputs and products as well as the activities undertaken to achieve them. In doing so, review the log frame of the original response plan and refer to it as appropriate	The response plan includes 5 outputs with corresponding activities **Output 1: Development of Response Plan and implementation planning and communication documents** 1.1. Response Plan 1.2 Implementation Plan 1.3 Monitoring and Evaluation plan 1.4 Impact description 1.5 Closure and data collection report **Output 2: Technology Roadmap Coordination Mechanisms** 2.1 Establishing a coordination mechanism 2.2 Regular Technology Roadmap Committee meetings 2.3 Regular Waste Committee and Water Committee meetings **Output 3: Identification of climate technologies for intervention in the high-impact sectors of waste management and water** 3.1a Analysis of waste sectors and identification of technologies 3.1b Analysis of water sectors and identification of technologies 3.2a Assessment of identified waste technologies 3.2b Assessment of identified water technologies **Output 4: Development of technology roadmap for NDC implementation** 4.1 Development of an NDC technology roadmap for identified sectors **Output 5: Preparation of Financing Support** 5.1 Two funding concept ideas, including two idea notes

Methodologies applied to produce outputs and products	Methodology subject to further elaboration. *Instruction: Examples of methodologies: E.g. cost-benefit analysis; surveys and structured interviews with key stakeholders etc.*
Reference to knowledge resources	*Instruction: Please indicate if any UNFCCC Technology Executive Committee (TEC) knowledge products (publications, briefs, tools etc.) were used in the implementation of the TA request, and which.* *Link to TEC knowledge database: https://unfccc.int/ttclear/tec/documents.html*
Deviations	*Instruction: Please describe any deviations from the response plan against the actual implemented activities, outputs and products*
Anticipated follow-up activities and next steps	*Instruction: Please describe planned follow-up activities after completion of technical assistance, including information on involved stakeholders and anticipated timelines.* *The following are some examples of next steps:* • *Submission of a draft law/policy developed by the CTCN to cabinet/parliament.* • *Follow-up and formal submission of funding proposal drafted with support from the CTCN.* • *Implementation of activities designed by the CTCN.* • *Dissemination of report drafted by the CTCN.* *Use of new expertise acquired during training led by CTCN.*

2. Lessons learned

	Lessons learned	**Recommendations**
Lessons learned from the CTCN TA process	*Describe lessons learned from following the steps of the TA process and interacting with the CTCN Secretariat. What were the challenges and essential factors contributing to successful implementation*	*Recommendations include* • *Steps which could be taken to improve the CTCN TA process* • *Considerations for increased success of similar efforts (i.e. regulatory, legal, stakeholders, communication, etc.)*
Lessons learned related to climate technology transfer	*Describe lessons learned, opportunities, and barriers for the use and deployment of the technology or technologies supported by the TA. The objective is to identify specific success factors for technology transfer*	*Recommendations include* • *Risk mitigation measures* • *Identified opportunities for over-coming barriers* • *Long-term sustainability (e.g. building endogenous capacities, funding opportunities, etc.)*

3. Illustration of the TA and photos

For communication purposes, please provide 2-4 Power Point slides, including illustrations or charts, describing barriers, opportunities, methodology, activities, outputs and achieved results. The illustrations must be copied into the TA Closure report but must also be delivered as power point files. Also, please provide at least five high-resolution pictures in jpg format, capturing technical assistance. The pictures should illustrate how the TA has impacted the lives of the beneficiaries in particular and the communities in general.

4. Impact Statement

The information in the table below will be used to communicate results and anticipated impacts of this technical assistance publicly. Please copy information from impact statement developed in the M&E Plan and update as relevant.

Challenge	*Approx. 500 characters with spaces*
CTCN Assistance	• Water and Waste sector analysis and technology identification • Develop Technology Roadmap for NDC implementation • Gender, youth integration • Two concept notes (water and waste respectively) for financing support
Anticipated impact	**In achieving intended NDC mitigation and adaptation impacts in the waste and water sectors respectively, a sector analysis and technology identification is required to guide the strategic building of capacity and technology deployment. Gender and youth integration will ensure maximised socio economic co-benefits in terms of access to jobs and services.** *Summarize the problem statement and desired impact. Describe how the TA is expected to lead to the desired impact. Include description of stakeholders, deliverables and timelines. As a minimum,*

	please include at least one of the core impact indicators from the closure report Annex.
Co-benefits: Achieved or anticipated co-benefits from the TA	**Implementation of the Technology Roadmap is expected to generate green jobs and maintain or improve access to waste and water services.** *<u>Instruction</u>: Please indicate expected co-benefits as described in the response plan and in the relevant deliverables*
Gender aspects of the TA	**The Technology Roadmap for NDC implementation will integrate gender and youth, through technical assistance provided by national and international gender experts.** *<u>Instruction</u>: Please indicate if technical assistance was supported by a gender analysis. Describe gender aspects identified and additional considerations taken to mainstream gender (e.g. equal participation in trainings, gathering of gender-disaggregated data, etc.).*
Anticipated contribution to NDC	**The sectors – waste and water – and the technical analysis will be aligned with the NDC.** *2 to 4 bullet points. Approximately 350 characters with spaces*
The narrative story	**To be completed upon completion of the project.**

	Approximately 1200 characters with spaces *Please provide a brief description of the background and context for the technical assistance. Describe the main problems and barriers for climate change mitigation and/or adaptation in terms of climate technologies that the CTCN technical assistance will address*
Contribution to SDGs A complete list of SDGs and their targets is available here: https://sustainabledevelopment.un.org/partnership/register/	**Reduction in GHG emissions in the waste sector through use of low carbon technology and integration of climate change measures in national strategies and planning** **(Contribution to 13: Climate Action 13.2 - Integrate climate change measures into national policies, strategies and planning)** **Strengthening adaptive capacity through climate smart technology in the water sectors** **(Contribution to 13: 13.1 - Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries** *To the extent possible, please describe contribution to approximately 3 SDGs, including SDG13, with a few sentences for each SDG concerned.*

Annex 1 Technical assistance data collection

Please add quantitative and qualitative values for the indicators selected in the M&E plan and monitored throughout the technical assistance in the tables below. Indicators which have been monitored in addition to the proposed indicators below may be added at the end of table A. Non-relevant indicators should be left blank.

A. Output and outcome indicators

Indicator Please note indicators below highlighted as **anticipated**	**Quantitative value** *Numerals only; disaggregates must sum to the total*	**Qualitative description** *List the various elements corresponding to the quantitative value as well as timelines and responsible institutions*
Total number of events organized by proponents and implementing partners	*Minimum 7, up to 12*	*Expected;* *Kick off workshop – august 2023* *2 meetings by waste committee* *2 meetings by waster committee* *End of project verficiation workshop* *Total: 6*
Number of participants in events organized by proponents and implementing partners		*TBC*
a) Number of men	*50% women/men*	*Participant data to be sex disaggregated with a gender target*
b) Number of women	*50% women/men*	*Participant data to be sex disaggregated with a gender target*
Number of climate technology RD&D related events	*TBC*	
Number of participants in climate technology RD&D events	*TBC*	
a) Number of men		
b) Number of women		
Number of training organized by proponents and implementing partners	*TBC*	*TBC*
Number of participants in trainings organized by proponents and implementing partners	*List total number here*	
a) Number of men		
b) Number of women		

Total number of institutions trained	*TBC*	*TBC based on coordination mechanism composition*
a) Governmental (national or subnational)		*List the name of organisations trained here*
b) Private sector (bank, corporation, etc.)		*List the name of organisations trained here*
c) Nongovernmental (NGO, University, etc.)		*List the name of organisations trained here*
Percentage of participants reporting satisfaction with CTCN training (from CTCN training feedback form)		*Satisfied= 4+ on 5-pt scale*
Percentage of participants reporting increased knowledge, capacity and/or understanding as a result of CTCN training (from CTCN training feedback form)		*Increased knowledge, capacity and/or understanding= 4+ on 5-pt scale*
a) Percentage of men		
b) Percentage of women		
Total number of deliverables produced during the assistance (excluding mission, progress and internal reports)	*14*	**Sum total of all deliverables listed in Response Plan**
a) Number of communication materials, including news releases, newsletters, articles, presentations, social media postings, etc.	**6**	*Corresponding with Committees events*
b) Number of tools and technical documents strengthened, revised or developed	**1**	Pakistan Technology Roadmap for NDC implementation for Waste and Water sectors
c) Number of other information materials strengthened, revised or created (For example training and workshop reports, Power Points, exercise docs etc.)	**6**	*Corresponding with Committees events*
Total number of policies, strategies, plans, laws, agreements or regulations supported by the assistance	*1*	Pakistan Technology Roadmap for NDC implementation for Waste and Water sectors
a) Adaptation related		
b) Mitigation related		
c) Both adaptation- and mitigation related	**1**	Pakistan Technology Roadmap for

		NDC implementation for Waste and Water sectors
Anticipated number of policies, strategies, plans, laws, agreements or regulations proposed, adopted or implemented as a result of the TA	*1*	Pakistan Technology Roadmap for NDC implementation for Waste and Water sectors
a) Water related (adaptation)		*List the type of documents anticipated to be proposed, adopted or implemented*
b) Waste related (mitigation)		*List the type of documents anticipated to be proposed, adopted or implemented*
c) Both adaptation- and mitigation related	**1**	Pakistan Technology Roadmap for NDC implementation for Waste and Water sectors
Anticipated number of technologies transferred or deployed as a result of CTCN support	*2*	Subject to assessment. One concept note for Water and one concept note for Waste sector anticipated. *<u>Instruction</u>: List the type of technologies supported by this assistance. Technologies must be identified from the CTCN taxonomy of climate sectors and technologies (download in pdf format and choose from column C): https://www.ctc-n.org/resources/ctcn-taxonomy*
Anticipated number of collaborations facilitated or enabled as a result of technical assistance	*2*	*One technology for each sector identified resulting in collaborations*
a) Number of South-South collaborations	**TBC**	*List the names of the organisations (excluding the CTCN or TA implementers)*
b) Number of RD&D collaborations	**TBC**	*List the names of the organisations (excluding the CTCN or TA implementers)*

c) Number of private sector collaborations	**2**	*One per sector* *List the names of the organisations (excluding the CTCN or TA implementers)*
Number of countries with strengthened National System of Innovation as a result of CTCN support	**1**	*Pakistan*
Insert any additional indicators here		

B. Core impact indicators

Please fill in the tables for anticipated impacts of the CTCN assistance. Every technical assistance should contribute to at least one of the indicators below. For guidance on how to report on core indicators see the 'M&E Guidance Document for TA Implementers'.

Core indicator 1	**Anticipated metric tons of CO_2 equivalent (CO_2e) emissions reduced or avoided as a result of CTCN TA** *Please add your calculations in word or excel format as an Annex to this Closure Report, where applicable.*	
	Anticipated metric tons of CO_2e reduced or avoided as a result of the TA **on annual basis**	Anticipated metric tons of CO_2e reduced or avoided as a result of the TA **in total**
Quantitative value *(emissions reductions)*	*Total number (numerals only, no rounding or abbreviations)*	*Total number (numerals only, no rounding or abbreviations)*
Unit	tCO_2e	tCO_2e
GHG assessment		

boundary (project emissions) Identify expected post-TA activities, associated effects and assess boundary for quantification of GHG emission reductions		
Baseline emissions Describe baseline scenario, baseline candidates, emission factors and emissions calculated		
Methodology Explain the method or process of verifying the indicator and how data was gathered		
Assumptions Describe assumptions made during calculation and quantification of GHG reductions		

Core indicator 2	**Anticipated increased economic, health, well-being, infrastructure and built environment, and ecosystems resilience to climate change impacts as a result of technical assistance**

	*Please provide a **qualitative** description of the anticipated impacts on the categories below*
Infrastructure and built environment Anticipated increased infrastructure resilience (avoided/mitigated climate induced damages and strengthened physical assets)	
Ecosystems and biodiversity Anticipated increased ecosystem resilience (areas with increased resistance to climate-induced disturbances and with improved recovery rates)	
Economic Anticipated increased economic resilience (e.g. less reliance on vulnerable economic sectors or diversification of livelihood)	
Health and wellbeing Anticipated increased health and wellbeing of target group (e.g. improved basic health, water and food security)	

Core indicator 3	**Anticipated number of direct and indirect beneficiaries as a result of the TA**	
	Quantitative value	**Means of verification**
Total beneficiaries	*Total number*	
Number of adaptation beneficiaries		*Describe calculation methods and assumptions made*
Number of mitigation beneficiaries		*Describe calculation methods and assumptions made*
Number of adaptation-and mitigation beneficiaries		*Describe calculation methods and assumptions made*

Core indicator 4	**Anticipated amount of funding/investment leveraged (USD) as a result of TA (disaggregated by public, private, national, and international sources, as well as between anticipated/confirmed funding)**			
	Quantitative value confirmed *in USD*	**Quantitative value anticipated** *in USD*	**Qualitative description** *List the institutions, timelines, and description or title of the investment*	**Methods** *Describe methods used for quantification of funds leveraged*
Total funding	*Total number in USD (numerals only, no rounding or abbreviations)*	*Total number in USD (numerals only, no rounding or abbreviations)*		
Anticipated amount of public funding mobilized from national/domestic sources				
Anticipated amount of public funding mobilized from international/ regional sources				
Anticipated amount of private funding mobilized from national/domestic sources				
Anticipated amount of private funds mobilized from international/regional sources				

Annex 2 (for internal use – to be filled in by the CTCN)

CTCN evaluation

This section will be completed by the relevant CTCN Technology Manager.

- Evaluation of the timeliness of the TA implementation as measured against the timeline included in the response plan;
- Evaluation of TA quality as defined in the response plan;
- Overall performance of the Implementers;
- Overall engagement of the NDE and Proponent;
- Lessons learned on the CTCN process and steps taken by the CTCN to improve.