

Guidelines:

- This Request Submission Form should be completed by the organisation requesting technical assistance from the Climate Technology Centre & Network (CTCN) in collaboration with the National Designated Entity (NDE) of the country in question
- The Form must be signed by the NDE. Please see updated contact list of NDEs here: <http://unfccc.int/ttclear/support/national-designated-entity.html>
- The Form can be submitted as a Word file containing a digital signature or as a signed and scanned PDF file in combination with an un-signed Word file
- For requests submitted by multiple countries, all the NDEs of the respective countries shall sign identical Forms before official submission to the CTCN
- NDEs have the opportunity to submit CTCN requests in collaboration with National Designated Authorities (NDAs) for the Green Climate Fund (GCF) if targeting the GCF Readiness Programme.

Requesting country or countries:	Bhutan
Request title:	Strengthening the Financial and Institutional Sustainability of Technological Solutions for a Circular Economy in Bhutan
NDE	National Environment Commission Secretariat Mr. Karma Tshering, Chief, Policy and Planning Division at Ministry of Agriculture and Forests ktshering@nec.gov.bt P.O. Box 466, Thimphu, Bhutan
Request Applicant:	Program Management Unit, Waste Management Flagship Program National Environment Commission Secretariat Mr. Thinley Dorji, Program Manager, Program Management Unit, Waste Management Flagship Program thinleydorji@nec.gov.bt Fourth Floor, San Maru Building, Norzin Lam, Chubachhu, Thimphu

Climate objective:

- Adaptation to climate change
- Mitigation of climate change
- Combination of adaptation and mitigation of climate change

Geographical scope:

- Community level
- Sub-national
- National
- Multi-country

If the request is at a sub-national or multi-country level, please describe specific geographical areas (provinces, states, countries, regions, etc.).

Problem statement related to climate change (up to one page):

Guided by Gross National Happiness, a sustainable and holistic approach to development, Bhutan is making rigorous conservation efforts and remains the only carbon-negative country in the world. According to the GHG emission time series data from 1994 – 2015, Bhutan continues to sequester more carbon than it emits with net national emission of -5,572.500 Gg of CO₂e in 2015. Further, the nation aspires to remain carbon-neutral for all times. However, Bhutan's GHG emission (excluding removal by sink) has been increasing and has almost doubled in 2015 compared to 1994 figures.

As for the waste management and related sector, while emissions is relatively low, it has still increased by 126.79% compared to the 1994 – 2015 period (Final Draft TNC, 2020). Such increased emissions is due to the increased waste generation is triggered by population growth, rapid urbanization and rural-urban migration which poses a significant threat to the environment due to minimal treatment, recovery and recycling of wastes. According to the National Waste Inventory Survey 2019, the per capita solid waste generation has been estimated at 0.23 kg per day. Of the total 172.16 tons of solid waste generated in a day in Bhutan, 45.9% is food waste followed by plastics and paper & cardboard at 17.1% and 15.8% respectively.

While the consumption patterns have changed and waste generation has increased over the years, the basic understanding, collection and management of waste have remained the same in many parts of the country. As a result, the landfills in Bhutan are overflowing. While a fraction of valuable dry waste is collected and sold to the recyclers, composting is negligible¹. Further, in absence of better alternatives, the waste service providers often resort to deep-pit burial and open pit burning of biomedical and hazardous wastes which is not environmentally and socially safe. In view of these grave concerns, there is a need to institute a holistic waste management practice across the country to address the growing waste related problems.

An innovative financial mechanism is essential to the holistic waste management practice as without it, addressing waste management in Bhutan is likely to remain difficult. In fact, the lack of suitable and dependable financial support for the waste sector has been a key barrier to proper waste management in the country as shortage of funds have resulted in inadequate capacity, technology, tools, equipment and workforce in the sector. Thus, a sustainable and innovative financial mechanism is the most important tool that underpins the successful implementation of the key interventions in the sector. It has also been emphasized as a key strategy in the National Waste Management Strategy of 2019.

Sustainable financial mechanism has the potential to realize integrated waste management which is a powerful driver to first, realize the significant GHG emissions mitigation potential the waste sector holds and second help achieve the sustainable development goals. Financial sustainability will allow the sustainable practice of 3Rs(reduce, reuse, recycle) through waste reduction, segregation of waste at source, combined composting and biogas generation, and improved collection and transportation systems. The mitigation of CH₄² from waste can be achieved by either composting; biogas production; or an integrated system where biogas generated from the compost pile is used for heating and cooking. Such a system will yield up to 236 kt CO₂e per annum of mitigation potential³. The mitigation options pertaining to waste also includes fuel switching (from fossils to biomass or refuse derived fuel under the industrial sector) and promotion of electric vehicles for waste collection. Such proper waste management practices outweigh the costs by far as they can not only prevent contamination of water (SDG 6), but also curb health hazards (SDG 3) and reduce GHG emissions and combat climate change (SDG 13).

¹ Only 1.77% of wastes from the commercial units are composted, for instance.

² Methane gas

³ Final Draft TNC, 2020

Past and on-going efforts to address the problem (up to half a page):

The Waste Prevention and Management Act of Bhutan, 2009 and the Waste Prevention and Management Regulations 2012 aspires to protect and sustain human health through protection of environment by reducing the generation of waste at source; promoting segregation, reuse and recycling of wastes, disposal of waste in an environmentally sound manner; and ensuring effective functioning and coordination among the implementing agencies. An amendment to the Waste Prevention and Management Regulations was passed in 2016 to introduce a system of incentives for waste prevention and management on the principle that waste is an asset. It also encourages entrepreneurship in the prevention, collection, segregation, and recycling of waste.

A National Integrated Solid Waste Management Strategy was developed in 2014 to promote “Zero Waste Bhutan” in partnership with the public, industry, civil society organizations, and government authorities at local and sectoral levels, municipalities, and funding agencies. To continuous such efforts, the National Waste Management Strategy 2019 was established and aims to reduce waste generations, manage waste, promote overall stakeholder participation, improve waste management service delivery and ensure proper treatment of all types of waste.

In line with the provisions of the National Waste Management Strategy 2019, the implementation of the National Waste Management Flagship Program from July 2020 and till June, 2023 will provide an end-to-end intervention for waste management in Bhutan. The flagship program aspires to transition from linear economy to circular economy by preventing and minimizing the generation of waste at source and diverting materials to be refused, re-used, recovered, and recycled, to reduce the amount of waste going to the landfill. In other words, National Waste Management Flagship consists of implementation of integrated waste management (IWM) focusing on the Circular Economy through 3R's (reduce, reuse, recycle/recover) using a combination of waste management techniques and technologies to treat different types of wastes in an environmentally, financially and socially sustainable manner. Ultimately, the flagship program's goal is to reverse the currently trend of disposing 80% of waste to the landfill to less than 15% by 2030.

In this regard, the Waste and Climate Change Project supported by WWF with financial assistance from the International Climate Initiative (IKI) conducted a financial analysis of estimating and projecting the cost of national waste management.

Specific technology⁴ barriers (up to one page):

Integrated waste management requires intensive use of environmentally sound technologies (ESTs), but waste management in Bhutan faces numerous barriers. Despite having enabling policy and legislations in place, series of technological barriers such as absence of appropriate infrastructure and technologies; the lack of technical knowledge and skills; and public support barrier pose a serious threat to sound waste management in Bhutan. Thus, the flagship program seeks to explore and adopt appropriate technologies that are locally appropriate based on quality, effectiveness and environmental impact. In addition, the flagship program also intends to develop technical capacity and to bring about behavioural change in waste management.

However, without instituting an innovative financial mechanism, the sustainability of the flagship program is questionable. According to the National Waste Management Strategy 2019, the existing programs are ‘chronically underfunded’ and some financial efforts have been inadequate and limited to a few equipment and machinery. A sustainable financial mechanism is an indispensable component of

⁴ **“any equipment, techniques, practical knowledge and skills needed for reducing greenhouse gas emissions and adapting to climate change”** (Special Report on Technology Transfer, IPCC, 2000)

Bhutan's pursuit of Zero Waste Bhutan as financing is the backbone of waste management. Previous studies point out that waste management is not an economic activity for income generation but a public service which require financing for cost recovery.

Therefore, a proper cost assessment should be conducted to develop a sustainable cost structure. An initial financial analysis was previously conducted to estimate and project the cost of waste management at a national scale and had charted out concrete recommendations on innovative financial mechanisms to finance waste management for all times based on the financial viability plan. However, further studies are required to validate the recommendations such as green tax system, tourist fee, revolving endowment funds through field data. Moreover, the suggested innovative financial mechanism should be refined to reflect the projected Flagship Programme through estimating capital and operational expenditures of the WM technologies described in the programme.

Second technology barrier identified is the absence of a detailed stakeholder management plan. While the flagship programme describes the detailed process for waste management, its detailed stakeholder engagement plan to implement the innovative financial mechanism needs further development. Pre-determining the possible issues of concerns for stakeholders is important to achieve a sustainable waste management system as there are variety of relevant stakeholders such as waste generators, service providers, regulators, the government and local community at different stages of the waste stream from source segregation, collection, transportation, treatment, disposal to recycling and resource generation. Early identification of the different environmental, technical, social and financial issues from each stakeholder and waste stream component is needed to minimize and effectively manage the conflicts beforehand. Therefore, a waste management committee should be installed to plan and monitor an integrated WM stream.

This technical assistance will help Bhutan in establish a concrete understanding of the current costs for the provision of the waste management services as described in the flagship program and the respective revenues. Through this technical assistance, Bhutan seeks to embark on an innovative financial mechanism that cover budgeting, cost accounting, financial monitoring and evaluation to not only meet the recurrent operation and maintenance cost, but also save and collect capital investments that the technological advancements in waste management may entail with the overall coordination from the WM committee established from the TA. In a nutshell, waste management in Bhutan must have a life of its own.

Sectors:

Please indicate the main sectors related to the request:

- | | | | |
|-----------------------------------------------|---------------------------------------------------------------------|---------------------------------------|------------------------------------------------------------|
| <input type="checkbox"/> Coastal zones | <input type="checkbox"/> Early Warning and Environmental Assessment | <input type="checkbox"/> Human Health | <input type="checkbox"/> Infrastructure and Urban planning |
| <input type="checkbox"/> Marine and Fisheries | <input type="checkbox"/> Water | <input type="checkbox"/> Agriculture | <input type="checkbox"/> Carbon fixation |
| <input type="checkbox"/> Energy Efficiency | <input type="checkbox"/> Forestry | <input type="checkbox"/> Industry | <input type="checkbox"/> Renewable energy |
| <input type="checkbox"/> Transport | <input checked="" type="checkbox"/> Waste management | | |

Please add other relevant sectors:

Cross-sectoral enablers and approaches:

Please indicate the main cross-sectoral enablers and approaches

- | | | | |
|------------------------------------------------------|-----------------------------------------------------------------------------|-------------------------------------------------------------|------------------------------------------|
| <input type="checkbox"/> Communication and awareness | <input checked="" type="checkbox"/> Economics and financial decision-making | <input checked="" type="checkbox"/> Governance and planning | <input type="checkbox"/> Community based |
| <input type="checkbox"/> Disaster risk reduction | <input type="checkbox"/> Ecosystems and biodiversity | <input type="checkbox"/> Gender | |

Technical assistance requested (up to one page):

The goal of this TA is to achieve sustainable waste management towards establishing a circular economy in Bhutan. The final outcome of the TA is to develop a waste management payment and sustainable operation strategies

First output is to conduct a technical review of the National Waste Management Flagship Program. Its activities are to review the barriers, key challenges and opportunities of the WM technologies identified in the Flagship Program. Then, to estimate the capital and operational expenditure of the WM technologies based on the previous case studies.

Second output is to develop a stakeholder engagement plan where its activities will cover the mapping of relevant stakeholders for key elements of the Flagship Programme and planning of an inter-institutional mechanism composed of gender-balanced national WM committee or board. This includes strengthening institutional capacity through benchmarking performance and organizational structure of state/local level institutions in the waste management sector.

Third output is to develop a payment model based on 'pay-as-you-throw' approach. The activities under this output are reviewing the previous study on the financial sustainability for the Flagship Programme, conducting a feasibility study of the policy measures suggested by the previous study (i.e. green tax system, tourist fee, revolving endowment funds), and Development of payment models based on PAYT approach with the national WM committee as planned in the previous output.

Forth output is the institutional capacity building for WM office and units. This activity will assess the current practices and performances of waste management unit and provide recommendations to prioritize duties and tasks to optimize operational plans. Second activity of this output is to hold capacity building workshop on institutional and operational planning for waste management. Relevant experts and professionals from public and private corporations/institutions will participate to share practices on programs and operations.

Expected timeframe:

		1	2	3	4	5	6	7	8	9	10	11	12
Output 1	Technical Review of the Waste Management (WM) Flagship Programme												
Activity 1.1	Review of barriers, key challenges and opportunities of the WM technologies identified in the Flagship Programme												
Activity 1.2	Estimation of the capital and operational expenditures of the WM technologies based on the case studies												
Output 2	Development of Key Stakeholders' Engagement Plan												
Activity 2.1	Role-mapping of relevant stakeholders for key elements of the Flagship Programme												
Activity 2.2	Strengthening institutional capacity through benchmarking performance and organizational structure of state/local level institutions in the waste management sector												
Activity 2.3	Planning of an inter-institutional interaction mechanism composed of gender-balanced national WM committee or board												
Output 3	Development of Payment Models Based on 'Pay-as-you-throw (PAYT)' Approach												
Activity 3.1	Review of the previous study on the financial sustainability for the Flagship Programme												
Activity 3.2	Feasibility study of the policy measures suggested by the previous study (i.e. green tax system, tourist fee, revolving endowment funds)												
Activity 3.3	Development of payment models based on PAYT approach w/ the national WM committee												
Output 4	Institutional Capacity Building for WM Office and Units												
Activity 4.1	Capacity building workshop on institutional and operational planning for waste management												

Anticipated gender and other co-benefits from the technical assistance:

Sustainable waste management has the potential to bring about economic, environmental, social and gender-sensitive development impacts. Economic co-benefits will arise from the creation of over 2000 job opportunities primarily through private sector involvement. Economic benefits can also be accrued through the production of energy using waste as raw materials. The environmental co-benefits of curtailing GHG emissions and reducing contamination of land, air and water extend well beyond Bhutan's geographical boundaries. With regards to the social co-benefits, substituting the import of chemical fertilizers through the production of organic compost using organic waste would help Bhutan reduce budget deficit while also contributing to the national food security. Further, improved waste management will not only have a positive impact on the tourism sector (the second highest revenue generating sector for Bhutan), but also lead to healthier citizens which would in turn reduce the public health cost of the government. The prevalent attitude, stereotypes and perceptions permeating the waste-gender nexus must be addressed through appropriate technological interventions; behavioural change interventions; and inclusion of both men and women in decision-making related to waste management.

Key stakeholders:

Stakeholders	Role to support the implementation of the technical assistance
National Designated Entity	Convey the request to CTCN
Request Applicant	Oversee the implementation of the technical assistance
Prime Minister's Office	Strategic guidance and monitoring
Gross National Happiness Commission Secretariat	Review and endorsement of the TA Request
National Environment Commission Secretariat	Review of the TA Request

Local Governments (Dzongkhags/Thromdes/Gewogs)	Right policy and legal instruments/governance structures/ monitoring and evaluation/partnership and coordination/enforcement
Waste handlers	Segregation and management at source; operation and management of waste facilities and infrastructure/information sharing
Households	Segregation and management at household/community level, fee payment/information sharing
Commercial Units	Segregation at source and fee payment/ information sharing
Please add as many stakeholders and lines as required.	

Alignment with national priorities (up to 2000 characters including spaces):

Please describe how the technical assistance is consistent with national climate priorities such as: Nationally Determined Contribution, national development plans, poverty reduction plans, technology needs assessments, Low Emission Development Strategies, Nationally Appropriate Mitigation Actions, Technology Action Plans, National Adaptation Plans, sectorial strategies and plans, etc.

Reference document (please include date of document)	Extract (please include chapter, page number, etc.).
Nationally Determined Contribution (NDC)	<p>Direct alignment and contribution to NDC implementation is required for all CTCN technical assistances. Please include a direct reference to the INDC/NDC document (chapter, page number, etc.).</p> <p>The GHG emissions reduction from the waste sector is identified in the Nationally Determined Contribution (NDC) under Mitigation Plan. It identifies GHG emission reduction through the enhancement of 3R principles and improving the waste management system and infrastructure.</p>
National Development Plans	<p>The technical assistance requested is in line with the provisions of Waste Prevention and Management Act of Bhutan 2009 and National Waste Management Strategy 2019. The project addresses one of the eight major priority programs specified for Bhutan's 12th Five-Year Plan, in the form of the Waste Management Flagship Program, which focuses on instituting integrated waste management systems based on the concept of circular economy. Furthermore, waste management is one of the main criteria used for allocation of resources to the local governments in the country to ensure sustainable waste management practices are instituted.</p> <p>Flagship programs are interventions designed to address high priority national issues that require multisectoral collaboration and coordination in a concerted manner. It is a notable feature of the 12th Five Year Plan. Waste management is identified as a flagship program to be implemented across 20 Dzongkhags with the objective of reducing waste at source and working towards Bhutan as a zero-waste society. The flagship program will also contribute to the achievement of National Key Result Area 6: Carbon Neutral, Climate and Disaster Resilient Development Enhanced. Furthermore, it is also aligned to Local Government Plans and Local</p>

	Government Key Result areas.
Technology Needs Assessment	The Technology Needs Assessment of Bhutan was completed in 2013 along with the Technology Action Plan. The solid waste disposal has been chosen as one of the priority sectors for climate change mitigation due to increase in GHG emissions from the sector. Within the sector, from various technologies the need for 3Rs and anaerobic digestion were identified as the most viable technologies. While the TAP was also prepared and some activities on 3Rs carried out implementation of the technologies in full scale has not been as successful due to lack of funding. Thus, the current project could look into revitalizing the initiative and take the action forward.
National Adaptation Plans	Bhutan launched its NAP process in 2015. The main aim of National Adaptation Plan for Climate Change is to reduce the country's vulnerability to climate change and to facilitate the integration of climate change adaptation in policies, programs and activities across sectors and levels. The NAP project also aims to build on Bhutan's Nationally Determined Contributions (NDC) by accelerating the NDC vision to scale up adaptation in the medium- to long-term and by focusing on priority sectors in the NDC, such as water resources. As of January 2021, Bhutan is in the processing of preparing the National Adaptation Plan (NAP).
Nationally Appropriate Mitigation Actions	Mitigation options in the waste sector include the practice of 3Rs through waste reduction, segregation of waste at source, combined composting and biogas generation, and improved collection and transportation systems. The mitigation of CH ₄ ⁵ from the waste can be achieved by either composting; biogas production; or an integrated system where biogas generated from the compost pile is used for heating and cooking. Such a system will yield up to 236 kt CO ₂ e per annum of mitigation potential ⁶ . The mitigation options pertaining to waste also includes fuel switching (from fossils to biomass or refuse derived fuel under the industrial sector) and promotion of electric vehicles for waste collection.
Policy and Legal Instruments	<p>The Constitution of the Kingdom of Bhutan, 2008 mandates every citizen to contribute to the protection of the natural environment, conservation of the rich biodiversity of Bhutan, and prevention of all forms of ecological degradation including noise, visual and physical pollution. Further, Gross National Happiness, a holistic and sustainable approach to Development upholds conservation of environment as one of the pillars.</p> <p>The Waste Prevention and Management Act of Bhutan, 2009 and the Waste Prevention and Management Regulations 2012 aspires to protect and sustain human health through protection of environment by reducing the generation of waste at source; promoting segregation, reuse and recycling of wastes, disposal of waste in an environmentally sound manner; and ensuring effective functioning and coordination among the implementing agencies. An amendment to the Waste Prevention and Management Regulations was passed in 2016 to introduce a system of</p>

⁵ Methane gas

⁶ Final Draft TNC, 2020

	<p>incentives for waste prevention and management on the principle that waste is an asset. It also encourages entrepreneurship in the prevention, collection, segregation, and recycling of waste.</p> <p>A National Integrated Solid Waste Management Strategy was developed in 2014 to promote “Zero Waste Bhutan” in partnership with the public, industry, civil society organizations, and government authorities at local and sectoral levels, municipalities, and funding agencies.</p> <p>Other relevant legal, regulatory, and organizational framework for waste management at the local, district and national levels include National Environment Protection Act 2007; Bhutan State of the Environment Report 2016; National Sanitation & Hygiene Policy, RGoB 2020; National Strategy & Action Plan for Low Carbon Development 2012; and National Waste Management Strategy (NWMS) 2019.</p>
Add others here as relevant	

Development of the request (up to 2000 characters including spaces):

The Thimphu city of Bhutan received the an Official Development Aid funded by the Ministry of Science and ICT of the Republic of Korea, “Bhutan Thimphu Master Plan for Improvement of Integrated Solid Waste Management (ISWM) System” implemented by Anayang University and the Green Technology Center. The objective of this project was to improve the current solid waste management condition to a low-carbon ISWM that secures the environmental health safety, encourages sustainable development, and achieves substantial GHGs emission. Its activities covered (1) promotion of recycling of valuable materials in municipal scale, (2) generation of renewable energy from waste, and (3) reduction of GHGs emission.

The proponent for this request was the Bhutanese counterpart for the discussions between Korea. In identifying the three streams of Solid Waste Management, the project group found gaps that needed to be addressed and linked with other funding sources. A previous study had been conducted by the WWF in studying the financial model for waste management. To further develop this study for site implementation, field data collection and validation of the collected secondary data is required. However, there is no further funding opportunities to perform such study. Therefore, the proponent and the project group will seek to develop a CTCN TA for secure the financial sustainability of the waste management in Bhutan by developing a feasible payment model for future implementation.

Background documents and other information relevant for the request:

- *NEC, 2020, Waste Management and Stray Dog Population Management Flagship Program: Blueprint document*
- *NEC, 2019, National Waste Management Strategy*
- *NEC, 2018, Waste Inventory and Baseline Study for Developing National and City Level Waste Management Strategies and Action Plans*
- *NSB, 2020, Rural-Urban Migration and Urbanization in Bhutan*
- *NSB, 2020, Harnessing Bhutan’s demographic dividend; policy and programmatic options*
- *NSB, 2019, Environmental Accounts Statistics*
- *NSB, 2019, Nation’s Waste on a Scale*
- *NSB, 2017, Bhutan Living Standard’s Survey Report 2017*
- *NSB, 2017, Bhutan Population and Census Housing*

OPTIONAL: Linkages to Green Climate Fund Readiness and Preparatory Support

The CTCN is collaborating with the GCF in order to facilitate access to environmentally sound technologies that address climate change and its effects, including through the provision of readiness and preparatory support delivered directly to countries through their GCF NDA. These actions are in line with the guidance of the GCF Board (Decision B.14/02) and the UNFCCC, particularly paragraphs 4 and 7 of 14/CP.22 that addresses Linkages between the Technology and the Financial Mechanisms⁷.

The CTCN is therefore implementing some of its technical assistance using GCF readiness funds accessed via the country's NDA. Any application for GCF support, including the amount of support provided, is subject to the terms and conditions of the GCF and should be developed in conjunction with the NDA.

Please indicate whether this request has been identified as preliminarily eligible by the NDA to be considered for readiness support from the GCF.

Initial engagement: The GCF NDA of the requesting country has been engaged in the design of this request and the NDA will be involved in the further process leading to an official agreement for accessing GCF readiness support.

Advanced engagement (preferred): The GCF NDA of the requesting country has been directly involved in the design of this request and is a co-signer of this request, the signature indicating provisional agreement to use readiness national funds to support the implementation of the technical assistance.

NDA name:

Date:

Signature:

Monitoring and impact of the assistance:

By signing this request, I affirm that processes are in place in the country to monitor and evaluate the technical assistance provided by the CTCN. I understand that these processes will be explicitly identified in the CTCN Response Plan and that they will be used in the country to monitor the implementation of the technical assistance following standard CTCN procedures.

I understand that, after the completion of the requested assistance, I shall support CTCN efforts to measure the success and effects of the support provided, including its short, medium and long-term impacts in the country.

Signature:

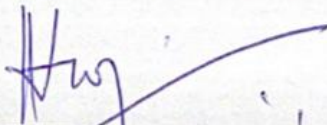
NDE name:

⁷ Please see:

https://unfccc.int/files/meetings/marrakech_nov_2016/application/pdf/auv_cop22_i8b_tm_fm.pdf

⁷ Please see:

https://unfccc.int/files/meetings/marrakech_nov_2016/application/pdf/auv_cop22_i8b_tm_fm.pdf

Date:	26.10.2021
Signature:	

THE COMPLETED FORM SHALL BE SENT TO THE CTCN@UNEP.ORG

The CTCN is available to answer all questions and provide guidance on the application process.