CTCN Technical Assistance

Request Submission Form

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 the National Designated Authorities (NDAs) for the Green Climate Fund (GCF) if targeting the GCF Readiness Programme.

Requesting country or countries:	The Republic of the Union of Myanmar
Request title:	Strengthening safe drinking water supply in rural Myanmar based on the gravity-driven membrane (GDM) technology
NDE	Environmental Conservation Department, Ministry of Natural Resources and Environmental Conservation Ms. Thin Thuzar Win, Deputy Director Email: climatechange.ecd@gmail.com; thinthuzar1981@gmail.com Address: Office No.53, Nay Pyi Taw, Myanmar
Request Applicant:	Department of Rural Development, Ministry of Agriculture, Livestock and Irrigation Name of a focal person: Dr. Win Min Oo, Deputy Director Email: winminoo.myanmar@gmail.com Alternative person: Mr. Zaw Nyunt Oo, Assistant Director Email: zawnyuntoo.drill@gmail.com Address: Department of Rural Development, Office No. 36, Nay Pyi Taw, Myanmar

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):

This section should answer the question "what is the problem?" Please summarise the problem related to climate change and/or the negative impacts of climate change in the country that the request aims to address.

Myanmar has substantial water resources; however, the resources are spatially and temporally unevenly distributed[1]. Therefore, water-related problems caused by different seasonal climate patterns vary depending on the geographic location. For example, people in the delta region and coastal zones face with storms, floods, sea level rise, drought, difficulties in freshwater access and saline water intrusion whereas water shortage resulting from frequent and prolong drought and irregular rainfall is serious risk to rural communities in the Central Dry Zone of Myanmar.

'Water resource management' has been targeted as the main sector of concern for climate change adaptation in Myanmar. It was selected as the second priority level sector in the National Adaptation Programme of Action (NAPA)[2]. Moreover, 'water resource management' was chosen as a priority sector for climate change adaptation, along with 'agriculture', in the process of the Technology Needs Assessment (TNA), which was carried out between 2018 and 2020 based on financial support from the Global Environment Facility (GEF). In this sector, 9 technology options were taken into account as adaptation measures, and 6 of them[3] were related to drinking water supply to households and/or communities in rural Myanmar such as Central Dry Zone, deltas, coastal areas and rural villages[4]. It was reported that overall access to safe drinking water in Myanmar increased from 63% to 69% between 2005 and 2010; however, there was still a difference between the urban and rural areas regarding its accessibility (81% of urban residents vs 65% of rural residents in 2010)[5].

[1] *NIVA (2017) Integrated Water Resources Management in Myanmar: Water Usage and Introduction to Water Quality Criteria for Lakes and Rivers in Myanmar - Preliminary Report. Report No. 7163-2017. Norwegian Institute for Water Research.*

[2] *National Environmental Conservation Committee (2012) Myanmar's National Adaptation Programme of Action (NAPA) to Climate Change. Ministry of Environmental Conservation and Forestry, the Republic of the Union of Myanmar.*

[3] *① Renovation and improvement in village ponds and tube wells for better livelihoods in Myanmar Dry Zone; ② Improvement in rooftop rainwater harvesting for adaptive delta management in Myanmar; ③ Solar-powered desalination and purification technology in coastal areas in Myanmar; ④ Water purifying technology in remote villages of Myanmar; ⑤ Solar powered water extraction in central Myanmar; ⑥ Rural water supply with gravity flow system in hilly regions of Myanmar*

[4] *ECD (2020) Technology Needs Assessment Report for Adaptation. Environmental Conservation Department, Ministry of Natural Resources and Environmental Conservation, the Republic of the Union of Myanmar.*

[5] *NIVA (2017) Integrated Water Resources Management in Myanmar: Water Usage and Introduction to Water Quality Criteria for Lakes and Rivers in Myanmar - Preliminary Report. Report No. 7163-2017. Norwegian Institute for Water Research.*

In rural Myanmar, reservoirs and community ponds are set up for water storage, and rainwater is collected for domestic and drinking water supply[6]. However, accessing safe drinking water is difficult for rural communities[7], and it is getting worse due to climate change. Limited access to safe and clean drinking water has caused health risk to residents in rural Myanmar. The prevalence of water-borne disease (e.g. diarrheal) increases during the summer and rainy seasons, which is largely due to water contamination from extreme weather events and unsanitary practices[8]. Groundwater is being used increasingly as a source of drinking water in Myanmar. But, due to geological reason, some groundwater contains relatively high concentrations of arsenic and fluoride which could cause severe health risk to the public[9].

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

This section should answer the question "what has been done or is currently being done to address the problem?" Please describe past and on-going processes, projects or initiatives implemented in the country or region to tackle the climate problem as described above.

Rural Myanmar has been unable to access safe drinking water sufficiently. There are many rural communities in which safe drinking water cannot be provided based on their existing facilities. Considering increase in climate change impact, safe and reliable drinking water supply to rural communities has been prioritized as a crucial target for adaptation in Myanmar. For example, based on the national stakeholder consultations and multi-criteria analysis (MCA) included in the Technology Needs Assessment (TNA) process, 'water purifying technology in remote villages of Myanmar' was identified as one of the top 3 adaptation measures in water resource management sector[10]. Moreover, in the National Adaptation Programme of Action (NAPA), projects related to safe water supply as well as installation of solar powered water purification system were chosen and implemented in order to reduce water-related health hazards of rural communities in Myanmar[11].

At the governmental level, Department of Rural Development (DRD) makes an effort to enhance drinking water quality and supply to rural communities in close collaboration with other departments of the Government, such as Environmental Conservation Department (ECD), Department of Public Health (DPH), Department of Meteorology and Hydrology (DMH), etc. With this, there is international cooperation (UNDP, UNICEF, UNHABITAT, JICA, etc.) to enhance safe drinking water supply to rural

[6] *NIVA (2017) Integrated Water Resources Management in Myanmar: Water Usage and Introduction to Water Quality Criteria for Lakes and Rivers in Myanmar - Preliminary Report. Report No. 7163-2017. Norwegian Institute for Water Research.*
[7] *ECD (2020) Technology Needs Assessment Report for Adaptation. Environmental Conservation Department, Ministry of Natural Resources and Environmental Conservation, the Republic of the Union of Myanmar.*
[8] *National Environmental Conservation Committee (2012) Myanmar's National Adaptation Programme of Action (NAPA) to Climate Change. Ministry of Environmental Conservation and Forestry, the Republic of the Union of Myanmar.*
[9] *NIVA (2017) Integrated Water Resources Management in Myanmar: Water Usage and Introduction to Water Quality Criteria for Lakes and Rivers in Myanmar - Preliminary Report. Report No. 7163-2017. Norwegian Institute for Water Research.*
[10] *ECD (2020) Technology Needs Assessment Report for Adaptation. Environmental Conservation Department, Ministry of Natural Resources and Environmental Conservation, the Republic of the Union of Myanmar.*
[11] *National Environmental Conservation Committee (2012) Myanmar's National Adaptation Programme of Action (NAPA) to Climate Change. Ministry of Environmental Conservation and Forestry, the Republic of the Union of Myanmar.*

Myanmar. Based on national and international support, diesel-based pumping system for irrigation and drinking water has been installed[12], and infrastructure for rainwater harvesting, wells, small dams, gravity flow system, etc. was provided to rural communities[13].

Specific technology[14] barriers (up to one page):

This section should answer the questions "what are the technology barriers that hinder national efforts described above" and "how will the CTCN technical assistance complement these efforts?" Building upon the problem statement and taking into consideration the existing efforts described above, please describe the specific technology barriers encountered by the requesting applicant to identify, assess or deploy climate technology(ies) in an effort to address the problem statement. The described barriers should be within the scope of the requested CTCN technical assistance (described in the section below).

Water pumping system using a diesel engine has been used for irrigation and domestic water and drinking water supply to rural households in Myanmar. However, due to high diesel cost and limited facilities to generate electricity, rural residents have difficulties in use of such system adequately[15]; therefore, they request alternative options for sustainable safe drinking water supply, in particular, to strengthen their climate resilience.

A gravity-driven membrane (GDM) technology is a small scaled, decentralized, eco-friendly water treatment measure. As applying gravity to produce purified drinking water without using additional energy, it needs very low energy consumption. It has been reported that the GDM filtration can reduce the levels of suspended solids and particulate matters as well as decrease the levels of water-borne bacteria and coliform substantively. The GDM technology can purify raw/contaminated water under low pressure conditions and operate longer without cleaning or flushing[16]. Moreover, operation and maintenance of the GDM technology are relatively easier and less costly compared to other conventional membrane-based water treatment technologies. Therefore, it could be an appropriate adaptation measure for safe drinking water supply to rural households or communities in Myanmar. The GDM technology could support to reduce a health risk in Myanmar caused by limited safe drinking water access as well as decrease a risk of drinking water scarcity in rural Myanmar caused by climate change and frequent drought.

Sectors:

Please indicate the main sectors related to the request:

☐ Coastal zones	☐ Early Warning and Environmental	☒ Human Health	☐ Infrastructure and

[12] *ECD (2020) Technology Needs Assessment Report for Adaptation. Environmental Conservation Department, Ministry of Natural Resources and Environmental Conservation, the Republic of the Union of Myanmar.*
[13] https://fukuoka.unhabitat.org/kcap/activities/egm/2012/pdf/egm06_en.pdf
[14] *"**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)*
[15] *ECD (2020) Technology Needs Assessment Report for Adaptation. Environmental Conservation Department, Ministry of Natural Resources and Environmental Conservation, the Republic of the Union of Myanmar.*
[16] *Pronk, W., Ding, A., Morgenroth, E., Derlon, N., Desmond, P., Burkhardt, M., Wu, B. & Fane, A. G. (2019) Gravity-Driven Membrane Filtration for Water and Wastewater Treatment: A Review. Water Research, 149, 553-565.*

	Assessment		Urban planning
☐ Marine and Fisheries	☒ Water	☐ Agriculture	☐ Carbon fixation
☒ Energy Efficiency	☐ Forestry	☐ Industry	☐ Renewable energy
☐ Transport	☐ Waste management		

Please add other relevant sectors:

Cross-sectoral enablers and approaches:

Please indicate the main cross-sectoral enablers and approaches

☐ Communication and awareness	☐ Economics and financial decision-making	☒ Governance and planning	☒ Community based
☒ Disaster risk reduction	☐ Ecosystems and biodiversity	☒ Gender	

Technical assistance requested (up to one page):

Founded on the problem statement, past/on-going efforts and technology barriers, please describe the requested technical assistance. The technical assistance should clearly contribute to mitigation or adaptation to climate change as described in the problem statement and contribute to overcome the specific technology barriers.

Within a clearly defined scope, the description of technical assistance should be structured into the following:

- *Overall objective;*
- *Anticipated groups of activities to be performed by the technical assistance; and*
- *Anticipated products to be delivered by the technical assistance.*

Please note that the CTCN facilitates technical assistance and is not a project financing mechanism.

Overall objective

An objective of the technical assistance request is to investigate the gravity-driven membrane (GDM) technology as an adaptation measure for safe drinking water supply to rural communities in Myanmar. Through the request, it is expected that the GDM technology will be installed at community levels, and treated drinking water will be monitored by an implementor of the technical assistance and the relevant departments of the Government in Myanmar.

Anticipated groups of activities to be performed by the technical assistance

- (Activity 1) Overall review of drinking water quality and scarcity in rural Myanmar (literature review);

- (Actvitiy 2) Site selection to install and test a GDM technology for drinking water supply at community levels;
- (Activity 3) Quality analysis of drinking water sources in the selected site(s) and design of GDM filtration to be applied;
- (Activity 4) Installation of the GDM technology in the selected site(s);
- (Activity 5) Monitoring and evaluation of the quality of drinking water provided from the GDM technology in the selected site(s);
- (Activity 6) Development of a protocol to monitor drinking water quality and maintain the GDM technology at community levels;
- (Activity 7) Capacity building workshop on sustainable management of the GDM technology at community levels; and
- (Activity 8) Assessment of dinking water consumption patterns and health survey in the selected site(s).

Anticipated products to be delivered by the technical assistance

- Report on the overall review of drinking water quality and scarcity in rural Myanmar;
- Installation and operation of the GDM technology for drinking water supply to rural communities in the selected site(s);
- Report on monitoring and evaluation of the quality of drinking water provided from the GDM technology in the selected site(s);
- Protocol to monitor drinking water quality and maintain the GDM technology at community levels;
- Capacity building workshop for rural communities in the selected site(s); and
- Report on assessment of dinking water consumption patterns and health survey in the selected site(s).

Expected timeframe:

Please indicate the expected duration period for the requested technical assistance. Please note CTCN technical assistance is limited to a maximum duration of 12 months.

The duration of the technical assistance is expected to be 12 months.

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

Please describe the activities with gender linkages as well as the anticipated gender and other co-benefits (e.g. biodiversity, economic, social, cultural, etc.) that are likely to be generated as a result of the technical assistance.

For more information you can find guidelines on the CTCN's website here:
https://www.ctc-n.org/technologies/ctcn-gender-mainstreaming-tool-response-plan-development

Further reading on gender can be found on the CTCN website here:
https://www.ctc-n.org/technology-sectors/gender

Anticipated gender co-benefits from the technical assistance

Most households in rural Myanmar boil water to have reliable drinking water. Women in households have the burden of drinking water generation and collection. Moreover, there is gender inequality with regards to travelling for water access, especially in Central Dry Zone of Myanmar during the drought season[17]. Use of the gravity-driven membrane (GDM) technology will make women spend less time to provide drinking water to their households or communities.

Anticipated other co-benefits from the technical assistance

The GDM technology has been reported to need very low energy supply for generating safe drinking water. Therefore, use of the GDM technology for safe and clean drinking water supply to rural communities in Myanmar will also result in energy saving and greenhouse gas (GHG) emissions reduction at community levels.

Key stakeholders:

Please list the stakeholders who will be involved in the implementation of the requested CTCN technical assistance and describe their role during the implementation (for example, government agencies and ministries, academic institutions and universities, private sector, community organizations, civil society, etc.).

Stakeholders	Role to support the implementation of the technical assistance
National Designated Entity (NDE)	- Support for coordination of the technical assistance and communication with stakeholders - Provision of overall feedback to the CTCN and the implementor during the implementation of the technical assistance
Request Applicant (Department of Rural Development, DRD)	- Support for coordination of the technical assistance and communication with stakeholders - Provision of feedback (practical or technical issues) to the CTCN and the implementor during the implementation of the technical assistance - Consultation about drinking water supply in rural areas of Myanmar and site selection for GDM technology installation
Department of Public Health (DPH)	- Consultation about the quality of drinking water and associated human health in rural areas of Myanmar - Consultation about site selection for GDM technology installation
Department of Meteorology and Hydrology (DMH)	- Consultation about drinking water sources in rural areas of Myanmar and site selection for GDM technology installation

Alignment with national priorities (up to 2,000 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.).

[17] https://www.sei.org/featured/rural-myanmar-frequent-intense-droughts-affecting-local-livelihoods/

Nationally Determined Contribution (NDC) (2017)	*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.).* "Addressing Climate Change Risks on Water Resources and Food Security in the Dry Zone of Myanmar" ** It was a project funded by the Adaptation Fund and implemented by UNDP. The project started in September 2015 as a 4-year project and has been completed.* (3. Adaptation – 3.3 Current and Planned Adaptation Efforts, p.11)
Technology Needs Assessment for Adaptation (2020)	"Water purifying technology in remote villages of Myanmar" (Chapter 4 Technology Prioritization for Water Resource Management Sector - 4.6 Results of Technology Prioritization for Water Resource Management Sector, p.57)
National Adaptation Programme of Action (NAPA) (2012)	"Reducing the vulnerability of local communities to climate-induced water-related health hazards through the provision of safe water supplies and sanitary latrines" (5. List of Priority Adaptation Projects for Implementation in Myanmar, p.58; 7. Annexes - Annex 1 Priority Adaptation Project Profiles i.e. Information for Project Implementation, p.89-90) "Enhancing the resilience of water supplies in the face of climate change for rural communities through solar powered water purification and irrigation pumping systems" (5. List of Priority Adaptation Projects for Implementation in Myanmar, p.59; 7. Annexes - Annex 1 Priority Adaptation Project Profiles i.e. Information for Project Implementation, p.103-104)

Development of the request (up to 2,000 characters including spaces):

Please describe how the request was developed at the national level and the process used by the NDE to approve the request before submitting it (who initiated the process, who were the stakeholders involved and what were their roles?) and describe any consultations or other meetings that took place to develop and select this request, etc.

The request has been developed based on discussions with relevant departments of the Government working for drinking water supply in rural Myanmar. Safe drinking water supply and associated public health improvement have been already included as an objective of climate change response, especially for rural areas of Myanmar. Previous and ongoing projects on drinking water supply to people in rural Myanmar have been reviewed, and their limitation has been identified in developing this request.

Background documents and other information relevant for the request:

- *Please list all relevant documents that will help the CTCN analyse the context of the request and national priorities. Please note that all documents listed/provided should be mentioned in this request in the relevant section(s), and that their linkages with the request should be clearly indicated. For each document, please provide web-links (if available) or attach to the submission form. Please add any other relevant information as required.*

- *Please indicate if this request has been developed with the support of the CTCN Request Incubator.*

1. Government plan & strategy for climate change response

- Nationally Determined Contribution (NDC) (2017)
  https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Myanmar%20First/Myanmar%27s%20INDC.pdf
- National Environmental Conservation Committee (2012) Myanmar's National Adaptation Programme of Action (NAPA) to Climate Change. Ministry of Environmental Conservation and Forestry, the Republic of the Union of Myanmar.
  https://unfccc.int/resource/docs/napa/mmr01.pdf
- ECD (2020) Technology Needs Assessment Report for Adaptation. Environmental Conservation Department, Ministry of Natural Resources and Environmental Conservation, the Republic of the Union of Myanmar.

2. Report & research article

- NIVA (2017) Integrated Water Resources Management in Myanmar: Water Usage and Introduction to Water Quality Criteria for Lakes and Rivers in Myanmar - Preliminary Report. Report No. 7163-2017. Norwegian Institute for Water Research.
- Pronk, W., Ding, A., Morgenroth, E., Derlon, N., Desmond, P., Burkhardt, M., Wu, B. & Fane, A. G. (2019) Gravity-Driven Membrane Filtration for Water and Wastewater Treatment: A Review. Water Research, 149, 553-565.

3. Webpage

https://www.sei.org/featured/rural-myanmar-frequent-intense-droughts-affecting-local-livelihoods/
https://fukuoka.unhabitat.org/kcap/activities/egm/2012/pdf/egm06_en.pdf

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 Mechanisms[18].

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.

[18] *Please see:* https://unfccc.int/files/meetings/marrakech_nov_2016/application/pdf/auv_cop22_i8b_tm_fm.pdf

☐ 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: Ms. Thin Thuzar Win, Deputy Director

Date: 28th September 2020

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.