

PRIVATE BAG 008
GABORONE
BOTSWANA



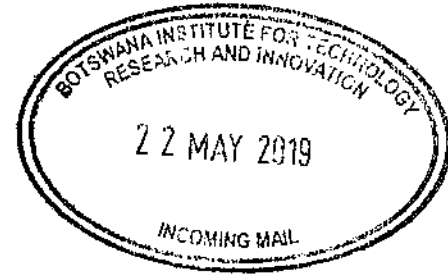
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REPUBLIC OF BOTSWANA
MINISTRY OF FINANCE AND ECONOMIC DEVELOPMENT

REF: MFED 170/1/4 A

21st May, 2019

Prof. Nnyaladzi Batisani
Chief Executive Director
Botswana Institute For Technolgy Research and Innovation
Machel Drive
Private Bag 0082
Gaborone, Botswana



Dear Prof. Batisani,

Subject: Technical Support for Updating Technology Needs Assessment for Botswana

Reference is made to your letter ref: BITRI 551.5 I (99) dated 6th May, 2019 regarding the above mentioned subject.

The NDA hereby endorses the request for technical assistance by the Department of Meteorological Services to conduct a Technology Needs Assessment (TNA) update. As the NDA we are of the view that undertaking the TNA will complement the country's climate change response and put in place a framework to guide the effective deployment of technology for national climate adaptation and mitigation initiatives.

We look forward to the successful undertaking of this key exercise.

Yours Sincerely,

Boniface G. Mphetlhe
for/ **PERMANENT SECRETARY**

Cc.: Permanent Secretary, Ministry of Environment, Natural Resources Conservation and Tourism
Director, Department of Meteorological Services

ED-NRM
(LR-CC)

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/tclear/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:	Botswana
Request title:	Please reflect the objective of the technical assistance in the title (maximum 200 characters). Technical support for Updating Technology Needs Assessment and Development of Technology Roadmaps for prioritized technologies
NDE	Please add name of organisation, name of individual, position, email and address. ORGANISATION: Botswana Institute for Technology Research CONTACT PERSON: Ms. Penny Lesolle POSITION: Researcher EMAIL ADDRESS: plesolle@bitri.co.bw , plesolle@gmail.com TELEPHONE: +267 3713007, +267 7164 3369 ADDRESS: Private Bag 0082, Gaborone, Botswana
Request Applicant:	Please add name of organisation, contact person, position, email and address of the organisation requesting assistance from the CTCN. ORGANISATION: Botswana Meteorological Services CONTACT PERSON: Mr Balisi Gopolang POSITION: Acting Director EMAIL ADDRESS: bgopolang@gov.bw TELEPHONE: 3612200 ADDRESS: P.O. Box 10100 Gaborone

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.

The impacts of global climate change and variability are becoming more evident with increased incidences of droughts, floods, hailstorms, more hot days and heat waves. Climate change is one of the biggest threats facing global development with the developing countries being more vulnerable due to their low adaptive capacity. Climate change has been widely recognized and accepted as a reality and that it poses serious problems with far reaching social, political, economic and environmental consequences, particularly in vulnerable countries such as Botswana.

The Government of Botswana regards climate change as one of the threats to the country and its people. In Botswana, climate change manifests itself in a number of ways: Botswana experiences increased variability of key climate elements such as temperature and rainfall. Government is of the view that climate change has the potential to undermine many of the positive developments made for attaining the country's developmental imperatives.

Some of the key sectors of the national economy affected by climate change include: 1) water resources where water security, quality has and continue to decline as climate is warming and rainfall is getting less balanced; 2) rangeland quality and productivity has decreased; 3) the agriculture sector has seen low yield and increased manifestation of pests and disease negatively affecting this once main contributor to National GDP; 4) human health has also not been spared as warmer climate has increased the prevalence of vector borne diseases to places where they initially were not known to exist; and 5) shift in ecosystem due to changing climate has potential to negatively affect the Tourism sector.

Technology is an important aspect in addressing climate change both in climate change adaptation and mitigation. In Botswana, a Technology Needs Assessment (TNA) has been conducted in 2004 and identified technology opportunities and potential in the following sectors and sub-sectors: 1) coal, coal bed methane (CBM), biogas and biofuels; 2) solar energy including solar pumping, solar water heating, passive solar designs, solar PV and solar cooling; 3) limited application of wind, and other biomass; 4) energy efficiency and demand side management activities; 5) wastewater utilisation; 6) treatment of brackish water; and 7) agricultural technologies for methane abatement. The TNA report also stated that the government should ensure that this TNA report is frequently updated and new action plans developed for implementation

The first national communication of Botswana states that 'access to technology, specifically regarding



predictive models, remote sensing and adaptation, is needed – especially in the agriculture, livestock, water supply and health sectors. Energy efficient technologies in the mining, industrial, energy, housing and transport sectors are also called for. Skills in technology assessment must be developed to enable decision-makers to select and promote technologies that are feasible, practical and meet the needs of both climate change considerations and human development’

The government of Botswana now wishes to update the TNA and to study in more depth the potential of some technologies. There is a need to revise this work to in order define the nature and scope of efforts required to deploy technologies, to ensure implementation of Botswana Nationally Determined Contribution (NDC), in line with national development priorities and Sustainable Development Goals. In particular, there is a need to take stock of efforts and technology deployment since the TNA in 2004, to prioritize the main sectors and sub-sectors of action, to prioritize key technologies in each of the selected sectors, and to define specific actions plans for enabling the scale-up of the chosen technologies in the country.

Undertaking the revision of this TNA will require additional fund, skills, capacities and the inputs of recognised international experts. It is therefore in this vein that CTCN is being requested for technical assistance including technical assessments, training and implementation plans to guide Botswana conduct Technology Needs Assessment for Climate change in the most critical sectors of the economy.

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.

Botswana is conscious of the serious consequences of climate change and was one of the founding signatories of the Convention and went on to ratify the Climate change convention (UNFCCC) and fully identifies with its ultimate objective.

Botswana prepared and submitted her Initial and second National Communications to the Convention in 2001 and 2011 respectively and currently working on her Third Communications. Botswana is also preparing its Climate Change policy that once complete and approved will be followed by a Strategy and a resource mobilisation framework.

In addition to this, Botswana continues to raise climate change awareness at all levels in Government, private sector, public but in most cases limited by resources and lack of legislation and policies in place. Botswana is also starting implementation of a Green Climate Fund readiness project to support the establishment of a National Designated Authority for the GCF and the preparation of a country programme, thus enabling the country maximise benefits from the fund and other climate finance mechanisms.

In its industrial expansion effort, Botswana will face a significant influx of new industrial and energy technologies. Botswana has shown through its high receptivity for clean energy technologies such as solar photo-voltaics and Solar Home Water Heaters that it is willing to adopt appropriate technologies in its development programmes. The technology influx will require advanced skills in technology assessment and technology trade or contracting. Addressing this need must be an integral part of any climate change support programme for Botswana.



Specific technology¹ 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).

The 5th Assessment report of IPCC (2014) identified the following economic barriers to adaptation decision-making namely transaction costs, market failures and missing markets, ethics and distributional issues, coordination/government failures/political economy and uncertainty. These economic barriers affect the development and transfer of climate technologies in Botswana. Since the Technology Needs assessment was developed in 2004 there were no resources to implement it. This has constituted a major barrier to the deployment of technologies. There is thus a need to look at newer technologies that have entered the market.

Specific technology barriers can be categorized into economic and financial; market conditions; legal and regulatory; network (weak connectivity between actors); institutional and organisational capacity; human skills; social, cultural and behavioural; information and awareness; technical and physical infrastructure deficit. Other barriers include: Inadequate funds for climate change response including acquisition of appropriate technologies; insufficient Research and Development of green technologies, inadequate incentives and enabling environment for productive research; inadequate pool of requisite skills in climate technologies arising from ineffective and poorly developed curricula at the primary, secondary and tertiary institutions of learning in the country etc.

The absence of Policies and legislation has also been a major barrier. It is therefore needed to mainstream climate change responses into development planning, decision making and implementation; build resilience and enhance adaptive capacity to the impacts of climate change; formulate programmes and plans to enhance the resilience and adaptive capacity of human and ecological systems to the impacts of climate change; mainstream intergenerational and gender equity in all aspects of climate change responses; provide incentives and obligations for private sector contributions to achieving low carbon climate resilient development; and mainstream the principle of sustainable development into the planning for and decision making on climate change response. The revision of the TNA aims to support these objectives through providing a solid framework for technology actions.

Sectors:

Please indicate the main sectors related to the request:

- | | | | |
|--|--|--|---|
| <input checked="" type="checkbox"/> Coastal zones | <input checked="" type="checkbox"/> Early Warning and Environmental Assessment | <input checked="" type="checkbox"/> Human Health | <input checked="" type="checkbox"/> Infrastructure and Urban planning |
| <input checked="" type="checkbox"/> Marine and Fisheries | <input checked="" type="checkbox"/> Water | <input checked="" type="checkbox"/> Agriculture | <input checked="" type="checkbox"/> Carbon fixation |

¹ "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)



- | | | | |
|---|--|--|--|
| <input checked="" type="checkbox"/> Energy Efficiency | <input checked="" type="checkbox"/> Forestry | <input checked="" type="checkbox"/> Industry | <input checked="" type="checkbox"/> Renewable energy |
| <input checked="" 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):

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
- Anticipated products to be delivered by the technical assistance.

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

The overall objective of the technical assistance is to conduct Technology Needs Assessment for Climate Change Mitigation and Adaptation in Botswana in most vulnerable economic sectors as identified the Botswana's NDC Document namely Agriculture, Energy, Industry etc. Also, to seek technical guidance for the different activities required to conduct the TNA process, including training on the TNA process, methodologies and quality control, together with the engagement of Consultant.

Scope of work includes:

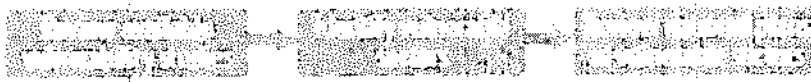
- Organizes all process of technological needs assessment process;
- Conducts desk study on previously conducted similar assessments;
- Liaises with relevant state, non-state and private stakeholders and organizes individual interviews or group discussions, site visits, etc. in order to conduct the study of current technological needs;
- Assess the constraints of institutions responsible for activities related to climate change in terms of technology issues through the collection, synthesis and analysis of existing



information;

- Conduct desk study on existing state programs and plans on technology transfer and capacity building for activities related to climate change, as well information on national resources allocated for climate change upon ratification of the UNFCCC;
- Organizes the process of data collection on financial resources, technology transfer, and technical support received from bilateral and multilateral donors, etc. for activities related to climate change, as well information on national resources allocated for climate change upon ratification of the UNFCCC;
- Provides periodic progress report to the Project Manager on the activities implemented in regards to needs assessment process;
- Ensure the timely and effective management of the activities as scheduled;
- Drafts the national Technology Needs Assessment report and detailed technology roadmaps for specific prioritized technologies for various sectors

Activity 1: Prepare initial review of options and resources



Activity 2: Identify technology criteria for assessment



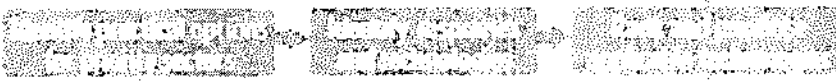
Activity 3: Prioritise sectors and select key technology(ies)



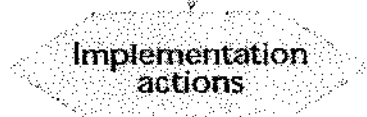
Activity 4: Identify barriers and policy needs



Activity 5: Define and select options



Activity 6: Prepare a synthesis report



Cross-cutting issues
(Stakeholder engagement and barrier analysis)

Anticipated Products to be delivered by the Technical Assistance:



The output of the support will be the TNA synthesis report, which contain the following elements:

- i. Review of the previous TNA and progress undertaken so far
- ii. Objectives for the revised TNA in the context of national development priorities
- iii. A description of the stakeholder process adopted
- iv. An evaluation of sectoral needs and opportunities
- v. A statement of data gaps
- vi. The criteria and process for technology assessment
- vii. Identification and assessment of technology options (including adaptation, if appropriate)
- viii. A list of priority sectors and key technologies for preliminary action for various sectors.
- ix. A review of key barriers related to existing plans and programmes and steps to overcome them
- x. The development of action plans for the prioritized technologies
- xi. Capacity building measures, if applicable
- xii. Identification of potential sources of funding

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.

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>

The Government of Botswana has established a fully-fledged Department of Gender Affairs who are a member of the National Climate Change Committee. The Gender Department will guide on National gender priorities.

The anticipated activities with gender linkages as well as gender and other co-benefits from the technical assistance will include:

1. Decision Making:

Equal participation of men and women in decision-making related to climate technology implementation or use. This will include their involvement in planning and consultation meetings, project planning process, including in climate technology user groups and cooperatives.

2. Capacity Building

Women and men benefit equitably from technical assistance and project-related training

3. Awareness Raising and Advocacy

Involvement of climate technology user groups, cooperatives and committees in awareness rising and advocacy in gender responsive manner.

Other anticipated co-benefits that will improve general quality of life include:

- Technology improvement and adoption of technological change,
- Capacity and Skills enhancement
- Increased productivity
- Contributions to energy security
- Business creation
- Reduced vulnerability
- Increased productivity
- Increased resilience

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/UNFCCC Focal Point	Ensure alignment with national priorities on climate change, synergy with applicant's organisation; ensuring adequacy of application and provides endorsement. Monitor and evaluate the technical assistance provided by the CTCN.
Request Applicant	Coordinates implementation of project and ensure synergy and reporting to the UNFCCC Focal Point.
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)	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.). Direct alignment and contribution to NDC implementation is required for all CTCN technical assistances. Please include a direct reference to the

	<p>INDC/NDC document (chapter, page number, etc.).</p> <p>This project will contribute to Botswana's Nationally Determined Contribution (NDC) resilience and emission reduction target. Botswana NDC submitted to the UNFCCC suggest that the country will reduce emissions by 15% by 2030. Sectors identified for adaptation and resilience are the water sector, agriculture and health.</p>
Technology Needs Assessment	Botswana prepared its first TNA in 2004
National Adaptation Plans	Botswana is yet to prepare her NAP.
Nationally Appropriate Mitigation Actions	Botswana has prepared a NAMA
Add others here as relevant	The Draft Climate Change Policy, scientific report, synthesis report, and the district consultation report, National Development plan 11, 1 st and 2 nd National Communications to the UNFCCC, and Botswana's NDC.

Development of the request (up to 2000 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 their roles were?) and describe any consultations or other meetings that took place to develop and select this request, etc.

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.

TNA, 2004

http://unfccc.int/ttclear/misc /StaticFiles/gnwoerk_static/TNR_CRE/e9067c6e3b97459989b2196f12155ad5/74a6f253859c48f488b9905b6862fda2.pdf

NDC

<https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Botswana%20First/BOTSWANA.pdf>

National Communication to the UNFCCC, 2001

http://unfccc.int/ttclear/misc /StaticFiles/gnwoerk_static/TNR_CRE/e9067c6e3b97459989b2196f12155ad5/0640e4ec7bb94d799b07bbaf1c76821f.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 Mechanisms².

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.

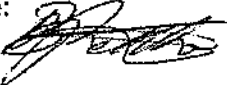
Please indicate whether this request has been identified as preliminarily eligible by the NDA to be considered for readiness support from the GCF.

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: Mr. Boniface G. Mphethe

Date: 21/05/2019

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:

² Please see:

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



CTCN

CLIMATE TECHNOLOGY CENTRE & NETWORK

CTCN Technical Assistance

Request Submission Form

NDE name: Penny M. Lesolle

Date: 06/05/2019

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.

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