

**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.

<b>Requesting country or countries:</b>	<b>Palau</b>
<b>Request title:</b>	<i>Please reflect the objective of the technical assistance in the title (maximum 200 characters).</i> <b>Restoring damaged coral reefs in Palau with heat-tolerant corals</b>
<b>NDE</b>	<i>Please add name of organisation, name of individual, position, email and address.</i> <b>David Idip, Senior GIS Analyst, Palau Automated Land and Resources Information System (PALARIS), Bureau of Budget and Planning, <a href="mailto:davididip@gmail.com">davididip@gmail.com</a>, Ministry of Finance, Koror, PW 96940 address</b>
<b>Request Applicant:</b>	<i>Please add name of organisation, contact person, position, email and address of the organisation requesting assistance from the CTCN.</i> <b>Yimnang Golbuu, CEO, Palau International Coral Reef Center, <a href="mailto:ygolbuu@picrc.org">ygolbuu@picrc.org</a>, 1 M-Dock Road, P.O. Box 7086, Koror, PW 96940</b>

**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.*

Coral reefs, some of the most diverse ecosystems on the planet, play a pivotal role in supporting people’s livelihoods in Palau. Coral reefs are at the centre of an ecosystem with significant socioeconomic benefits such as tourism and fishing, as well as hazardous risk reduction benefits. The economic benefit of coral reefs tourism has been estimated at USD 92.5 million per year and contributes to 43% of the Palau’s GDP. Furthermore, corals are home to fauna such as reef fish and giant clam, which are an important source of food and income for local communities. Studies show that coral reefs can reduce wave energy by an average of 97%, which can help enhancing the resilience of coastal communities.

However, coral reefs are threatened by climate change impacts. Increase in sea surface temperature as a result of climate change has led to bleaching of corals in many parts of the world. In the past 10 years, climate change and elevated sea surface temperature killed 14% of the world’s coral reefs<sup>1</sup>. This has resulted in a decline in hard coral cover of at least 20% in the Pacific Ocean<sup>2</sup>.

Rise in sea surface temperature and ocean acidification as a result of climate change is causing more frequent and severe coral bleaching events. If ocean warming continues, projections estimate that widespread coral bleaching will occur annually in Palau by 2040<sup>3</sup>.

This is likely not only to negatively affect the economy, but also make coastal areas more vulnerable to natural disasters, as corals are proven to provide disaster risk reduction benefits.

**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.*

To address these challenges related to climate change mentioned in previous section like increasing temperatures and sea level rise, Palau has established marine protection areas along the coast to conserve coral reefs under the Palau Protected Areas Act (2003), which provides the overall framework to protect corals.

Conventional coral reef restoration technologies such as direct transplantation have low coral survival rates of 64% and may lead to damaging the existing environment<sup>4</sup>.

Thus, heat-tolerant corals can be introduced to restore damaged coral reefs as well as build resilience

<sup>1</sup> GCRMN (2021) “Status of Coral Reefs of the World: 2020”

<sup>2</sup> Ibid

<sup>3</sup> van Hooijdonk et al.(2016) Local-scale projections of coral reef futures and implications of the Paris Agreement.”

<sup>4</sup> Bostrom-Einarsson (2020) “Coral restoration – A systematic review of current methods, successes, failures and future directions”

to climate change impacts. Under these circumstances the Ministry of the Environment, Japan (MOEJ) implements heat-tolerant coral restoration using advanced sexual coral reproduction method with artificial substratum. However, this and other technologies to restore damaged coral still face significant barriers.

**Specific technology<sup>5</sup> 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).*

Major barriers faced by coral restoration technologies in Palau are:

- Conventional coral reef restoration technology has a negative impact on the existing ecosystem and has low coral survival rate of 64% in average.
- Lack of knowledge and understanding on coral reef restoration technology by the community, as well as lack of continuity has led to failed restoration attempts.
- Lack of long-term commitment and local capacity has been a challenge in past coral reef restoration projects both in Palau and other Pacific countries.
- Lack of finance to conduct advance technology feasibility and demonstration to restore the coral reefs.

**Sectors:**

*Please indicate the main sectors related to the request:*

- |  |   |                                       |  |
|--|---|---------------------------------------|--|
| <input checked="" 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 checked="" type="checkbox"/> Marine and Fisheries | <input checked="" 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 type="checkbox"/> Waste management                           |                                       |  |

Please add other relevant sectors:

**Cross-sectoral enablers and approaches:**

*Please indicate the main cross-sectoral enablers and approaches*

<sup>5</sup> “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 type="checkbox"/> Communication and awareness	<input checked="" type="checkbox"/> Economics and financial decision-making	<input type="checkbox"/> Governance and planning	<input type="checkbox"/> Community based
<input checked="" type="checkbox"/> Disaster risk reduction	<input checked="" 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.*

This technical assistance (TA) will support the deployment of heat-tolerant corals in Palau, which can address rising sea surface temperature and assist in building community resilience to climate change. The TA will also provide capacity building of Palau International Coral Reef Center (PICRC) and involve local communities as well as NGOs throughout the process, since coral reef restoration technology is still an emerging technology in Palau.

The TA will be implemented for 12 months, which will include the development of a roadmap for deployment of the technology to other Pacific nations. In the long run, GCF financing may be leveraged to scale the technology to other Pacific Islands, while having PICRC as the leading institution in implementing restoration activities in the Pacific.

The overall objective of the project is to demonstrate the feasibility of heat-tolerant coral transplantation in Palau and improving PICRC capacity with the technology to make them a center of excellence leading coral restoration efforts in the Pacific.

The broad outcomes of the project are:

- Outcome 1- Manage, monitor, evaluate and transplant heat-tolerant corals and develop a comprehensive plan for coral restoration
- Outcome 2- Provide capacity building of PICRC on the restoration technology.
- Outcome 3- Identify bottlenecks and creating a roadmap of deploying the technology to other Pacific nations under the PICRC initiative.

**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>*

Deploying heat tolerant coral has the potential for improving ecosystem resilience, enhancing biodiversity and livelihoods in the coastal areas of Palau. Restoring coral reefs and enhancing biodiversity can help women gain more income opportunities as women play a significant role in harvesting invertebrates near the coastal areas. According to the Palau's 2020 National Report on Gender and Natural Resources, women tend to dominate nearshore invertebrate fisheries such as clams and sea cucumbers, with 85% of the survey respondents who were engaging in harvesting invertebrates were women.

Coral reefs provide also valuable compounds that have potential use for medicine, and 90% of currently available drugs with marine origin are from coral reefs<sup>6</sup>.

Thus, restoring damaged coral reefs has the possibility of improving the well-being and socioeconomic status of Palauan communities.

The TA will ensure the equal representation of women and men as well as participation of gender focal points and associations that promote gender equality and empowerment of women and other vulnerable groups throughout the process. Furthermore, a gender-sensitive training curriculum and materials will be developed to encourage participation of women and other vulnerable groups. There will also be emphasis on gender balance on the actual training sessions and meetings. In this regard, a gender expert will be consulted throughout the implementation of the TA to mainstream gender in each activity.

**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
Palau Automated Land and Resource Information System Office, Ministry of Finance (National Designated Entity)	Focal point of the country to CTCN.
Palau Coral International Reef Center (PICRC)	PICRC is Palau's research institute on coral reefs that was established in 2001 with Japanese grant aid. PICRC primarily conducts research on Palau's coral reefs as well as the surrounding ecosystem, enhance public awareness, and promote capacity building in Palau. PICRC will be heavily involved in the reef restoration process and will be the

<sup>6</sup> International Coral Reef Society (2020) "Coral Reefs and Human Health"

	main beneficiary of capacity building activities in the technical assistance.
Ministry of Finance (National Designated Authority)	Focal point of the country to the Green Climate Fund facilitating access to financing for future scale up.
Ministry of Finance Bureau of Budget and Planning (Designated Authority AF)	Focal point of the country to Climate Adaptation action ensuring coordination with country's climate change adaptation strategy, planning and ongoing efforts.
Ministry of Agriculture, Fisheries, and the Environment	The Ministry of Agriculture, Fisheries and the Environment is responsible for developing, managing, and protecting the natural resources of Palau. The ministry will be involved in the coordination of TA activities.
Palau Conservation Society (PCS)	PCS is a non-governmental organization based in Palau, which aims at conserving Palau's natural heritage and resources for local communities. PCS will be participating in the execution and implementation of the coral reefs monitoring plan.

**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.*

<b>Reference document</b> (please include date of document)	<i>Extract (please include chapter, page number, etc.).</i>
Nationally Determined Contribution (NDC)	Palau's Intended Nationally Determined Contribution (INDC) identifies ocean warming and ocean acidification as major concerns heavily impacting coral reefs of the country, which is crucial to Palau's economy, culture, and livelihoods.
Technology Needs Assessment	
Nationally Appropriate Mitigation Actions and National Adaptation Plans	These points are also stressed in Palau's Climate Change Policy, a landmark policy that incorporates Palau's National Appropriate Mitigation Actions (NAMA) and National Adaptation Plan (NAP).
National Communications	Moreover, in Palau's National Communication (NC), conserving coral reefs is considered as part of the overall strategy for climate change adaptation and sustainable development. Specifically, the NC recommends establishing marine protected areas and integrating coastal zone management as some of the ways to reduce climate change impacts on coral reefs.
Add others here as relevant	

**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 were their roles?) 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.

**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<sup>7</sup>.

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:

<sup>7</sup> Please see:

[https://unfccc.int/files/meetings/marrakech\\_nov\\_2016/application/pdf/auv\\_cop22\\_i8b\\_tm\\_fm.pdf](https://unfccc.int/files/meetings/marrakech_nov_2016/application/pdf/auv_cop22_i8b_tm_fm.pdf)

**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: David K Idip Jr.

Date: April 25, 2022

Signature:



**THE COMPLETED FORM SHALL BE SENT TO THE [CTCN@UNEP.ORG](mailto:CTCN@UNEP.ORG)**

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