Summary of Climate Technology Centre and Network (CTCN) technical assistance

This technical assistance should focus on developing a framework and methodology to map the forestry sector using Earth observation and estimation of the carbon sinks in Samoa and identifying possible issues and opportunities of using REDD+ to increase the carbon sinks of Samoa.

This would include the following activities:

**FOREST MAPPING AND CARBON SINKS POTENTIAL IN SAMOA**

1. Mapping of vegetation and general land cover for the island of Samoa (Savai' and Upolu Island) through Earth Observation.
2. Classification of the forest and land cover by categories.
3. Assessment of map accuracy through field data collection at sites selected by stratified random sampling (identify trees, nature of the forest).
4. Definition of a methodology and creation of a model to estimate the amount of carbon that could be stored or captured through each category of land/forest.

**REDD+ AND CARBON SINKS POTENTIAL IN SAMOA**

5. Analyse Samoa national strategies for forest management, AFOLU and Forestry and identify potential barriers or opportunities to access the REDD+ mechanisms.
6. Develop a framework that help Samoa in managing its forests sustainably and monitor any landscape changes.

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1 NDC: manage forests sustainably and increase total forest cover by 2 percent by 2030 relative to 2013. [https://unfccc.int/sites/default/files/NDC/2022-06/Samoa%27s%20Second%20NDC%20for%20UNFCCC%20Submission.pdf](https://unfccc.int/sites/default/files/NDC/2022-06/Samoa%27s%20Second%20NDC%20for%20UNFCCC%20Submission.pdf)
Agreement:
(If possible, please use electronic signatures in Microsoft Word file format)

National Designated Entity to the United Nations Framework Convention on Climate Change (UNFCCC) Technology Mechanism
Name: Lealaisalanoa Frances Reupena
Title: CEO MNRE
Date: 08.08.22
Signature: 

Climate Technology Centre and Network (CTCN)
Name: Rose Mwebaza
Title: Director of CTCN
Date: 08.08.2022
Signature: 

1. Background and context

Samoa ratified the UNFCCC in 1994, which means it is obligated to take certain steps to implement this international agreement. The obligations related to mitigation are, for example:

- Article 4.1(d): Samoa is obliged to manage, conserve and enhance sinks and reservoirs of greenhouse gases, including forests and other terrestrial, coastal and marine ecosystems
- The results from Samoa’s second GHG inventory provide an important starting point from which to assess mitigation options. The GHG inventory was prepared using the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, and assessed emissions in the following four sectors: energy, industrial processes and product use (IPPU), agriculture, forestry and other land use (AFOLU), and waste

As outlined in the second GHG inventory, Samoa’s existing forests are an important carbon sink and could be absorbing up to 800,000 t CO2 per annum (GoS, 2008).

A number of government initiatives have played a role in protecting Samoa’s forest resources. These include:

- Establishment of National Parks
- Ban on Commercial Logging
- Reforestation Program
- Community Forestry Program

Forest protection is to be promoted to conserve Samoa’s indigenous species and maintain biodiversity habitats for Samoans’ existence as well as acting as sinks for the GHGs.

More recently in its updated NDC, Samoa aims to expand the area under agroforestry to an additional 5 percent of agricultural land by 2030 relative to 2018.61 Increasing the use of agroforestry is expected to contribute to several important ecosystem services. For example, agroforestry systems help protect crops from cyclone damage, diversify agricultural incomes, and reduce riverine flood risk.

Secondly, Samoa aims to manage forests sustainably and increase total forest cover by 2 percent by 2030 relative to 2013.62 Managing forests responsibly and promoting afforestation is expected to moderate stream flow (reducing the risk of riverine flooding and drought), protect indigenous ecosystems, preserve cultural values, and maintain the supply of non-timber forest products.

Overview of measures and requirements to achieve targets: It is expected that expanding agroforestry will be achieved by awareness raising activities that promote traditional knowledge of agroforestry systems and provide targeted support, including providing seedlings to landholders. Samoa can support the expansion of agroforestry without the need for external financial support, however the success of the agroforestry program will require external technical assistance as well as consent from landholders to determine the areas on which trees will be planted and who will be responsible for planting and monitoring the trees.

It is expected that Samoa can manage forests sustainably gradually and increase total forest cover by developing a program for reforestation and forest restoration. Samoa would require external financial support and technical assistance to develop this program. The expansion of forest area would also require consent from various stakeholders to determine the areas on which forest will be planted and who will be responsible for planting and monitoring these areas.

2. Problem statement

Samoa would like to explore opportunities to work with partners and other countries on approaches in forestry sector However, there are many complications in the different approaches in registry set up and potential projects we can have and not undermining the environmental integrity of the process. We would like to work with CTCN on the development of a framework and methodology to map the forestry sector using Earth observation and estimation of the carbon sinks in Samoa.

Some initiatives have been developed in Samoa in the past 15 years to improve the management of forest, and successfully achieved to lower the deforestation rate. However, no previous seems to have been made to map the forest of Samoa, or to estimate the carbon sinks of Samoa.

The existing barriers are estimated to be both technical, legal, institutional and financial.
There is recognition by Samoa of the links between forests as carbon sinks and climate change. As a party to the Framework Convention on Climate Change and the Kyoto Protocol, Samoa actively contributes at the global level to the debate on ways and means of ameliorating this problem. At the national level, however, outside of the context of public education and awareness activities wherein climate change is discussed, this has yet to translate into real practical action. The issue of carbon credits and carbon sequestration are mere theoretical concepts yet to be concretized into anything tangible and beneficial.²

² Samoa Forestry Outlook report, 2009
3. Logical Framework for the CTCN Technical Assistance:

**Objective**: Developing a framework and methodology to carbon sinks from the forestry sector using Earth observation in Samoa.

**Outcome**: The Technical Assistance will map and estimate the potential of carbon sinks in the island of Samoa, quantify the annual soil loss rates, and develop a framework that help Samoa in managing its forests sustainably and monitor any landscape changes.

| Mandatory output: Development of implementation planning and communication documents |
|---|---|---|---|---|---|---|---|---|---|
| Activity: All implementers must undertake the following activities at the beginning and at the end of the CTCN technical assistance. |
| i) A detailed work plan of all activities, deliveries, outputs, deadlines and responsible persons/organisations and detailed budget to implement the Response Plan. The detailed work plan and budget must be based directly on this Response Plan. |
| ii) Based on the work plan, a monitoring and evaluation plan with specific, measurable, achievable, relevant, and time-bound indicators used to monitor and evaluate the timeliness and appropriateness of the implementation. The monitoring and evaluation plan should apply selected indicators from the Closure and Data Collection report template and enable the lead implementer to complete the CTCN Closure and Data collection report at the end of the assignment (please refer to item iv below and section 14 in the Response Plan); |
| iii) A two-page CTCN Impact Description formulated in the beginning of the technical assistance and update/revised once the technical assistance is fully delivered (a template will be provided); |
| iv) A Closure and Data Collection report completed at the end of the technical assistance (a template will be provided). |

<table>
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<tr>
<th>Mandatory Deliverable:</th>
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<tbody>
<tr>
<td>i) Detailed work plan</td>
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<td>ii) Monitoring and evaluation plan</td>
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<tr>
<td>iii) CTCN Impact Description</td>
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<tr>
<td>iv) Closure and Data Collection report</td>
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Output 1: TA coordination mechanism established

**Activity 1.1**: Map relevant stakeholders and establish a stakeholder working group

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3 NDC: manage forests sustainably and increase total forest cover by 2 percent by 2030 relative to 2013 [https://unfccc.int/sites/default/files/NDC/2022-06/Samoa%27s%20Second%20NDC%20for%20UNFCCC%20Submission.pdf](https://unfccc.int/sites/default/files/NDC/2022-06/Samoa%27s%20Second%20NDC%20for%20UNFCCC%20Submission.pdf)
The activity will identify relevant stakeholders among governmental institutions at the national and sub-national levels, sector professionals, private sector, civil society, academic institutions, and beneficiaries. Based on this list of stakeholders, a limited working group will be created. This working group will oversee supervising the implementation of this Technical Assistance. It shall maintain a gender balance and an adequate representation from vulnerable groups. The working group will provide a technical overview and a high-level guidance at every stage of implementation.

**Activity 1.2: Organize consultative meetings with the working group**
Consultative meetings will be held with each member of the working groups to understand previous initiatives that could have been developed, access existing maps, surveys, technical analysis that could have been done as well as to discuss the results of the previous initiatives, analyse the recently done GHG emissions, discuss what the country really expects as results of this technical assistance, gather existing maps of the forest, etc. During this meeting will be discussed where should be tool be hosted, by which entity, the format of the tool (excel or digital) and who should be the future users and administrators of the tool.

**Activity 1.3: Organize a multi-stakeholder inception workshop**
A 3-hours multi-stakeholder workshop will be organized at the beginning of the Technical Assistance, to inform the stakeholders of the start of this TA and ensure their adequate participation throughout the implementation process. This meeting will be held in person. It is expected that a maximum of 50 persons will participate.

- 1.1 Stakeholder mapping report containing a complete stakeholder list. X
- 1.2 Minutes of the consultative meetings. X
- 1.3 Minute of the inception workshop with the list of participants, disaggregated by gender, materials used of the workshops and photos of the event. X

**Output 2: FOREST MAPPING AND CARBON SINKS POTENTIAL IN SAMOA**

**Activity 2.1: Preliminary analysis/survey of available gridded datasets and Climate data collection; (rainfall and temperature datasets)**
This preliminary survey will inform where to put effort in terms of data collection. The exercise will be desktop based and will make use satellite data from various platform including NASA satellite data, Copernicus, GEO. Other Data source: Rainfall dataset obtained from; a) Global Precipitation Mission (GPM) for rainfall data from year 2015 onward with a resolution of 10Km sq. b) TRMM -NASA for rainfall data before 2015 with a resolution of 25km sq. Temperature dataset obtained for MODIS from year 2000 to date. Analysis methodology to include timeseries computation for the above data.

**Activity 2.2: Classification of the forest and land cover by categories**
The classification should be:

- comprehensive, scientifically sound and practically oriented.
- meet the needs of a variety of users (neither single-project oriented nor taking a sectoral approach); users can use just a sub-set of the classification and develop from there according to their own specific needs.
- potentially applicable as a common reference system and facilitate comparisons between classes derived from different classifications.
- be a flexible system, which can be used at different scales and at different levels of detail allowing cross-reference of local and regional with continental and global maps without loss of information.
- able to describe the complete range of land cover features (e.g., forest and cultivated areas as well as ice and bare land, etc.), with clear class boundary definition that are unambiguous and unique.
- adapted to fully describe the whole variety of land cover types with the minimal set of classifiers necessary (the less classifiers used in the definition, the less the error expected and the less time and resources necessary for field validation); and based on a clear and systematic description of the class, where the diagnostic criteria used to define a class must be clearly defined, with pure land cover criteria distinct from environmental criteria (e.g., climate, floristic and altitude), as the latter influence land cover but are not inherent features.

The categories to be used for the classification should be aligned with Samoa’s strategies and existing classifications.

The categories should be discussed and validated by the NDE before initiating the classification.

Activity 2.3: Meeting with the working group
The results of activity 2.1 & 2.2 will be discussed during a meeting (that can be held virtually) with the working group. The classification of the forest cover by categories should be revised and approved by the working group before processing with the rest of the activities. This classification should be aligned with national strategic documents as well as with the data available. Also, this meeting will enable the implementer to discuss and agree on the sites to be used for the next activity with the working group.

Activity 2.4: Assessment of map accuracy through field data collection at sites selected by stratified random sampling. (Identify trees, nature of the forest)

https://www.fao.org/3/X0596E/x0596e01f.htm
During this activity, the implementer will organise a stratified random sampling collection on the sites defined with Samoa during the previous meeting.

The most ‘convenient’ method of sampling is that in which the investigator selects several sampling units which he considers ‘representative’ of the whole population. For example, in estimating the whole volume of a forest stand, he may select a few trees which may appear to be of average dimensions and typical of the area and measure their volume.

The object of designing a sample survey is to minimise the error in the final estimates.

A sampling scheme is determined by the size of sampling units, number of sampling units to be used, the distribution of the sampling units over the entire area to be sampled, the type and method of measurement in the selected units and the statistical procedures for analysing the survey data. A variety of sampling methods and estimating techniques developed to meet the varying demands of the survey statistician accord the user a wide selection for specific situations. One can choose the method or combination of methods that will yield a desired degree of precision at minimum cost.

In any sample survey, we must first decide on the type of data to be collected and determine how adequate the results should be. Secondly, we must formulate the sampling plan for each of the characters for which data are to be collected. We must also know how to combine the sampling procedures for the various characters so that no duplication of field work occurs. Thirdly, the field work must be efficiently organised with adequate provision for supervising the work of the field staff. Lastly, the analysis of the data collected should be carried out using appropriate statistical techniques and the report should be drafted giving full details of the basic assumptions made, the sampling plan and the results of the statistical analysis. The report should contain estimate of the margin of the sampling errors of the results and may also include the possible effects of the non-sampling errors. Some of these steps are elaborated further in the following.

(i) **Specification of the objectives of the survey:** Careful consideration must be given at the outset to the purposes for which the survey is to be undertaken. For example, in a forest survey, the area to be covered should be decided. The characteristics on which information is to be collected and the degree of detail to be attempted should be fixed. If it is a survey of trees, it must be decided as to what species of trees are to be enumerated, whether only estimation of the number of trees under specified diameter classes or, in addition, whether the volume of trees is also proposed to be estimated. It must also be decided at the outset what accuracy is desired for the estimates.
(ii) **Construction of a frame of units:** The first requirement of probability sample of any nature is the establishment of a frame. The structure of a sample survey is determined to a large extent by the frame. A frame is a list of sampling units which may be unambiguously defined and identified in the population. The sampling units may be compartments, topographical sections, strips of a fixed width or plots of a definite shape and size.

(iii) **Choice of a sampling design:** If it is agreed that the sampling design should be such that it should provide a statistically meaningful measure of the precision of the final estimates, then the sample should be a probability sample, in that every unit in the population should have a known probability of being selected in the sample. The choice of units to be enumerated from the frame of units should be based on some objective rule which leaves nothing to the opinion of the field worker. The determination of the number of units to be included in the sample and the method of selection is also governed by the allowable cost of the survey and the accuracy in the final estimates.

(iv) **Organisation of the field work:** The entire success of a sampling survey depends on the reliability of the field work. In forest surveys, the organization of the field work should receive the utmost attention, because even with the best sampling design, without proper organization the sample results may be incomplete and misleading. Proper selection of the personnel, intensive training, clear instructions and proper supervision of the fieldwork are essential to obtain satisfactory results. The field parties should correctly locate the selected units and record the necessary measurements according to the specific instruction given. The supervising staff should check a part of their work in the field and satisfy that the survey carried out in its entirety as planned.

(v) **Analysis of the data:** Depending on the sampling design used and the information collected, proper formulae should be used in obtaining the estimates and the precision of the estimates should be computed. Double check of the computations is desired to safeguard accuracy in the analysis.

(vi) **Preliminary survey (pilot trials):** The design of a sampling scheme for a forest survey requires both knowledge of the statistical theory and experience with data regarding the nature of the forest area, the pattern of variability and operational cost. If prior knowledge in these matters is not available, a statistically planned small scale 'pilot survey' may have to be conducted before undertaking any large-scale survey in the forest area. Such exploratory or pilot surveys will provide adequate knowledge regarding the variability of the material and will afford opportunities to test and improve field procedures, train field workers and study the operational efficiency of a design. A pilot survey will also provide data for estimating the various components of cost of operations in a survey like time of travel, time of location and enumeration of sampling units, etc. The above information will be
of great help in deciding the proper type of design and intensity of sampling that will be appropriate for achieving the objects of the survey.  

The results of the sampling will be fully detailed in report that will be circulated with the working group for review. At least 2 weeks will be provided to the working group for this review and a final report will be edited, taking into consideration all relevant comments received.

2.5 Meeting with the working group to discuss the model to estimate the amount of carbon sinks that could be stored or captured through each category of land/forest  
During this meeting, the implementer will explain the methodology expected to be used to create the model and estimate the amount of carbon sinks that could be stored or captured through each category of land/forest. It would be relevant to invite, or to have a separate meeting with the entity in charge of updating the GHG inventory of Samoa to understand what has been done with regards to carbon sinks, what has not been done, and why. The NDE will kindly connect the implementer with the entity currently working on the GHG inventory.

2.6 Definition of a methodology and creation of a model to estimate the amount of carbon sinks that could be stored or captured through each category of land/forest  
It is expected that the implementer will develop a model to estimate the amount of carbon sinks that could be stored or captured through each category of land/forest based on the classification made previously.

2.7 Presentation of the model in an in-person workshop of a day with the working group and future administrators and users of the model.  
The implementer will organize a one-day in person meeting in Samoa in presence of the working group, as well as any relevant other stakeholders (future users and administrators) or the model to explain the model, the methodology and provide the stakeholders the opportunity to have a working session on the tool so that they can identify and raise their questions relative to the tool.

2.8 Testing of the model by the working group, and selected group of stakeholders (future users and administrators of the model)  
The model will be available for testing during 3 months by a limited number of users and administrators (contact persons will be selected with the working group) to test the model. During this period, the implementer will make sure to provide support and answers to the users and modify/correct/amend the model when and if needed.

2.9 Guide for the use of the model  
A full guide will be prepared that will describe the functionalities of the model, the methodology used for its conception, the assumptions, the source of the data, the options offered by the tool so that future users and

[5 https://www.fao.org/3/x6831e/x6831e12.htm]
administrators can benefit and use the tool at its best efficiency. The guide will be delivered in digital and paper format, and will be translated, if required, into up to 3 local languages.

| Deliverable 2.1 | Preliminary analysis/survey of available gridded datasets and Climate data collection | X |
| 2.2 | Classification of the forest and land cover by categories | X |
| 2.3 | Minute of the meeting with the working group to discuss the classification of the forest cover by categories | X |
| 2.4 | Assessment of map accuracy through field data collection at sites selected by stratified random sampling. | X |
| 2.5 | Meeting with the working group to discuss the model to estimate the amount of carbon sinks that could be stored or captured through each category of land/forest | X |
| 2.6 | Definition of a methodology and creation of a model to estimate the amount of carbon sinks that could be stored or captured through each category of land/forest | X |
| 2.7 | Presentation of the model in an in-person workshop of a day with the working group and future administrators and users of the model. | X |
| 2.8 | Minute of the questions and bugs identified during the testing of the model by the working group, and selected group of stakeholders (future users and administrators of the model) | X |
| 2.9 | Guide for the use of the model | X |

Output 3: REDD+ and carbon sinks potential in Samoa and develop a framework that would help Samoa in managing its forests sustainably and monitor any landscape changes.

Activity 3.1: Analyse national strategies and identify potential barriers or opportunities to develop REDD+ project in Samoa.

The implementer will analyse whether Samoa could use the carbon market mechanisms by using REDD+ to generate carbon credits that could be sold to international buyers and generate additional revenues to the country, that could also be used to protect and rehabilitate Samoa’s forest.

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6 NDC: manage forests sustainably and increase total forest cover by 2 percent by 2030 relative to 2013. [https://unfccc.int/sites/default/files/NDC/2022-06/Samoa%27s%20Second%20NDC%20for%20UNFCCC%20Submission.pdf](https://unfccc.int/sites/default/files/NDC/2022-06/Samoa%27s%20Second%20NDC%20for%20UNFCCC%20Submission.pdf)
The results of this analysis will be presented in a report, with clear SWOT analysis and possible options to leverage identified barriers and bottlenecks. The report will also provide a clear roadmap of next steps to be implemented by the country to develop REDD+ projects should this option be identified as feasible. The roadmap will provide a clear pathway of the registration of a project under the REDD+ mechanisms from the “project idea stage” until the emission and selling of the credits.

**Activity 3.2: Define the framework’s vision and mission (1 or 2 days – open to all stakeholders).**
In preparation of this workshop, the implementer will benchmark other countries’ vision and mission on the management of sustainable forest, to explain with examples the importance of these concepts. After providing a definition of vision and mission, as well as the example of other countries from the region or globally, the TA coordination team will define, together and through a participative process, the definition of the vision and mission that the policy framework should adopt. The presence of youth, women, and vulnerable populations is fundamental for this workshop. The vision and mission should be agreed by the stakeholders, including public and private sectors, vulnerable populations, academical, NGOs, etc.

**Activity 3.3: Define the framework objectives through a workshop (2nd -3rd day for TA Steering Committee)**
Once the vision and mission will be defined, the workshop will continue with the working group to define the objective of the framework and the goals that the framework will aim to achieve. As per the country’s NDC, Samoa has committed to manage its forests sustainably and increase total forest cover by 2 percent by 2030 relative to 2013. The objective should be clear and concise. The implementer will play an important role in moderating the discussion to ensure the objectives that promote sustainable management of forest, and cover the long-term, to balance environmental, socio-economic, cultural and recreational objectives; reduce forest degradation; and conserve and maintain existing forest from potential climate change impacts. The objective should involve local communities or stakeholder’s participation in decision of sustainable environmental management for the forest of Samoa. The implementer will manage the discussion based on his experience to make sure only objectives are listed at this stage.

Members of the working group might not be able to participate to all 5-day workshops. The implementer, along with the members of the working group will decide the relevant participation of each member prior to the selection of the dates for the workshop to make sure relevant representative of the working group are available for their respective workshops. For this workshop, a presence of policy makers (public institutions is required). The Team leader and the senior experts in sustainable forest management should also be present.

**Activity 3.4: Define the Guiding principles through a workshop (4th and 5th day for TA Coordination team).**
Following the definition of a vision, a mission, and objectives, the working group will look at defining the guiding principles that will guide the implementation of the framework. Members of the working group might not be able
to participate to all 5-day workshops. The implementer, along with the members of the Steering Committee will decide the relevant participation of each member prior to the selection of the dates for the workshop to make sure relevant representative of the Steering Committee are available for their respective workshops. For this workshop, a mix of policy makers and users of the framework should be invited. The Team leader and the senior experts in sustainable forest should also be present.

**Activity 3.5: Formulate a draft of framework policy based on the inputs received during the 5-day workshops**
Based on the inputs received from the 5-days workshops training, the implementer will draft a first version of the framework. On sustainable forest for Samoa.

**Activity 3.6: Share the draft of framework policy for comments and review from the Steering Committee**
The draft framework should be achieved by month 6 after signature of the agreement and should be shared with the working group for 2 months to enable the country to incorporate the relevant comments into the document.

**Activity 3.7 Finalize the framework based on the comments received from the relevant stakeholders**
The implementer will review the framework and finalize the document. The final version will again be shared to the relevant stakeholders for 2 weeks, for final clearance.

**Deliverable:**
3.1 Report on the opportunity to use the REDD+ to develop REDD+ carbon projects in Samoa.
3.2: Defined vision and mission of the framework and report of the workshop held (list of participants, questions photos, participatory process used to ensure the participation of all members, results, questions raised, comments addressed etc.)
3.3 Report on the selected framework objectives as well as description of workshop held (list of participants, questions photos, participatory process used to ensure the participation of all members, results, questions raised, comments addressed etc.)
3.34 Report with the defined guiding principles as well as description of workshop held (list of participants, questions photos, participatory process used to ensure the participation of all members, results, questions raised, comments addressed etc.)
3.5: Formulation of a Draft Framework for sustainable forest management in Samoa.
3.6: Revised Draft Framework based on working group’s comments
3.7 Final framework
4. Resources required and itemized budget: To be defined but estimated between **250,000 USD**
## 5 Profile and experience of experts

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<tr>
<th>Experts required</th>
<th>Brief description of required profile</th>
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<td><strong>International experts</strong></td>
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| Team Leader and expert in sustainable forest management and inventory (I1) | • A minimum of 15 years relevant work experience in REDD+, sustainable forests, AFOLU GHG inventory, evaluation of carbon sinks, or similar.  
• At least 5 demonstrated experience in carbon sinks calculation and sustainable forest management.  
• Excellent abilities to interact with local stakeholders, collect and evaluate data and transform the information into high quality documentation tangible to the target audience.  
• Excellent written and communication skills in English. |
| Policy Expert (I2) | • A minimum of 15 years relevant work experience in drafting environmental policies, laws, frameworks.  
• At least 5 demonstrated experience in drafting environmental laws, frameworks, policies in Africa.  
• Excellent abilities to interact with local stakeholders, collect and evaluate data and transform the information into high quality documentation tangible to the target audience.  
• Excellent written and communication skills in English. |
| Earth observation expert (I3) | • A minimum of 15 years relevant work experience in earth observation, forestry mapping, GIS, use of drones to develop decision-making tools or affiliate.  
• At least 5 demonstrated experience using earth observation techniques in the region.  
• Excellent abilities in the generation and interpretation of maps. |
| **National experts** | |
| National expert in sustainable forestry (N1) | • A minimum of 5 years of relevant work experience in drafting environmental or forestry related policies.  
• Proven experience of sustainable forest and evaluation of carbon sinks will be valued.  
• Proven working experience in Samoa is required. Presence in Samoa will be a plus.  
• Good communication skills. |
| Gender Expert (N2) | • A minimum of 5 years relevant work experience in the field of gender equality and gender mainstreaming.  
• Formal training in gender analysis and gender planning and demonstrated expertise in mainstreaming gender in projects and programmes.  
• Excellent abilities to interact with local stakeholders, collect and evaluate data and transform the information into high quality documentation tangible to the target audience.  
• Previous work experience in the region is required.  
• Excellent written and communication skills in English. |
6 Intended contribution to the expected impact of the technical assistance

The technical assistance will contribute to enhance the technological capacities by filling information gaps, provide physical and human capacities and demonstration of these technologies’ application. The technical assistance will support technology transfer mechanism for using earth observation and EO tools including drones in monitoring the carbon sinks of Samoa, that will lead to raise the resilience of national ecosystems.

7 Relevance to NDCs and other national priorities

Direct alignment and contribution to NDC implementation is required for all CTCN technical assistances. 3 sections on AFOLU, all relevant, mainly those on adaptation to climate change: These are the goals as listed in the NDC, p6

- AFOLU - expand the area under agroforestry to an additional 5 percent of agricultural land by 2030 relative to 2018.
- AFOLU - manage forests sustainably and increase total forest cover by 2 percent by 2030 relative to 2013.

8 Links to relevant parallel activities:

Some initiatives on forestry mapping have been initiated in Samoa:

- For example, a "Vegetation Mapping of Samoa" held in 2011:
  A map of vegetation and general land cover for the islands of Tutuila, Aunu'u, Ofu, Olosega, and Ta'u in Samoa was created based on high resolution QuickBird satellite imagery supported by field observations. Map accuracy was assessed using field data collected at sites selected by stratified random sampling. This updated map provides relatively detailed information about the status of Samoa's vegetation, which is important for land managers and other local decisionmakers as well as researchers and the public.

- Samoa's Forest Resources: Forest Inventory and Analysis, 2012
  This analysis defines estimates of forest area, stem volume, biomass, numbers of trees, damages to trees, and tree size distribution as well as overstory and understory vegetation cover and information on invasive plant species presence and cover.

- Vegetation Mapping Inventory Project for National Park of Samoa:
  https://www.nps.gov/im/vmi-npsa.htm

- National Forest Inventory in the year 2013
  Forest Carbon (IPCC Source Category 3B1a): Samoa has developed the National Forest Inventory in the year 2013. The National Forest Inventory (NFI) sub-component was established through interview surveys and forest surveys in Upolu and Savaii. The study captured information related to landowners, land users, and the production and usage of non-timber forest products. The 2013 forest survey focused on tree biomass and non-tree biomass field surveys, field data entry processing and analysis, and reporting. Based on the forest area in 2013, the current carbon stock for each forest type over Samoa was estimated. The country's total carbon is 45,736,227 ton, which is composed of 8,814,724 ton in Upolu and 36,921,502 ton in Savaii. Most of the carbon (63%) in Savaii is derived from Medium Dense Forest (FM). Savaii island has a larger area of Medium Dense Forest (FM) where higher soil carbon content. Forest-based carbon stock in Samoa decreased from 1999 to 2013 (-1,567,595 c-ton or -3% against 1999), corresponding to the decrease of the forest area.

- GHG Inventory, 2022
  A current GHG inventory is being finalized in Samoa and should be available in 2023. Samoa's GHG inventory also includes estimates of CO2 removals in forests. However, there is significant uncertainty in these estimates, as they do not include changes in the total area of forest in Samoa that may have occurred during the inventory period. As shown below, the inventory does include CO2 removal and no emissions due to logging and fuel wood extraction and any clearing of forests. There is some anecdotal evidence to suggest that forests are being cleared for cattle farming. However, the general contraction in Samoa’s agricultural sector since the 1990s taro blight

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8 https://www.fs.fed.us/pnw/pubs/pnw_rb269.pdf
suggests that some former croplands may have been converted back to forests. It is estimated that the net carbon removal in the forest and planation is 775,937 net CO2e removals.

9 Anticipated follow-up activities after this technical assistance are completed:
Following the implementation of this TA, it is planned that the country will look at the possibility to use the carbon market mechanisms to generate carbon credits that can be sold to international parties to continue protecting Samoa’s environment and forest resources.

10 Benefits in terms of gender and co-benefits:

| Imbedded into the design of the activities: | The gender linkages and other co-benefits (e.g., biodiversity, economic, social, cultural, etc.) are likely to be generated because of the technical assistance. Such as ecosystem-based adaptation, potential of ecosystems to participate in the market approaches. |
| Gender and co-benefits of the activities: | A better management plan and framework will increase forests sustainability and reduce the population’s vulnerability to climate change. |

Labour population of agriculture in Samoa accounts for 67% of total labour population. Agriculture women share 73% of total women’s labour force. - Cash cropping is needed for agriculture which was formerly done on self-sufficient basis. - Ministry of Agriculture, Fisheries and Forest (MAFF) are promoting policy in response to women’s contribution to agriculture and changing their roles. - MAFF is conducting gender sensitization for extension worker and put it duty to have extension to women’s farmer as job description. - Each village must draw fisheries management plan and women’s committee in the village involves its deliberation.

11 Main national stakeholders in the implementation of the technical assistance activities:

<table>
<thead>
<tr>
<th>National Stakeholder</th>
<th>Function in the implementation of the technical assistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Designated Entity</td>
<td>MNRE</td>
</tr>
<tr>
<td>Request Applicant</td>
<td>MNRE</td>
</tr>
<tr>
<td>Please add as many stakeholders and lines as required.</td>
<td>All government ministries, environmental NGOS, CBO, women groups, communities and local counterparts.</td>
</tr>
</tbody>
</table>

12 Contribution to the SDGs:

<table>
<thead>
<tr>
<th>Goal:</th>
<th>Sustainable Development Goal</th>
<th>Direct contribution from CTCN TA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>End poverty in all its forms everywhere</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>End hunger, achieve food security and improved nutrition, and promote sustainable agriculture</td>
<td>The TA will map the soils using climate technologies to increase the resilience of the country to erosion.</td>
</tr>
</tbody>
</table>

| 3 | Ensure healthy lives and promote well-being for all at all ages |
| 4 | Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all |
| 5 | Achieve gender equality and empower all women and girls |
| 6 | Ensure availability and sustainable management of water and sanitation for all |
| 7 | Ensure access to affordable, reliable, sustainable, and modern energy for all (consider adding targets for 7) |
|   | 7.1 - By 2030, ensure universal access to affordable, reliable, and modern energy services |
|   | 7.2 - By 2030, increase substantially the share of renewable energy in the global energy mix |
|   | 7.3 - By 2030, double the global rate of improvement in energy efficiency |
|   | 7.a - By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology |
|   | 7.b - By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States, and land-locked developing countries, in accordance with their respective programmes of support |
| 8 | Promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all |
| 9 | Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation |
| 10 | Reduce inequality within and among countries |
| 11 | Make cities and human settlements inclusive, safe, resilient, and sustainable |
| 12 | Ensure sustainable consumption and production patterns |
| 13 | Take urgent action to combat climate change and its impacts |
|   | 13.1 - Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries |
|   | 13.2 - Integrate climate change measures into national policies, strategies, and planning |
|   | 13.3 - Improve education, awareness-raising and human and institutional capacity on climate change |

All technical assistance should indicate relevance to SDG 13 and at least one of the following targets (13.1 to 13.b).

Samoa is facing a forest management issue and estimating the carbon sinks will be a first step in a better management of this ecosystems with strong impact on GHG emissions.
<table>
<thead>
<tr>
<th>Classification of technical assistance:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Primary</strong></td>
</tr>
<tr>
<td>☐ 1. Decision-making tools and/or information provision</td>
</tr>
<tr>
<td>☐ 2. Sectoral roadmaps and strategies</td>
</tr>
<tr>
<td>☐ 3. Recommendations for legal reforms, policies, and regulations</td>
</tr>
<tr>
<td>☐ 4. Financing facilitation</td>
</tr>
<tr>
<td>☐ 5. Private sector engagement and market creation</td>
</tr>
<tr>
<td>☐ 6. Research and development of new technologies</td>
</tr>
<tr>
<td>☐ 7. Feasibility of technology options</td>
</tr>
<tr>
<td>☐ 8. Piloting and deployment of technologies in local conditions</td>
</tr>
<tr>
<td>☐ 9. Technology identification and prioritization</td>
</tr>
</tbody>
</table>

*Please note that all CTCN technical assistance contributes to strengthening the capacity of in-country actors.*
14 Monitoring and evaluation process
Upon contracting the implementing partners to implement this Response Plan, the lead implementer will produce a monitoring and evaluation plan for the technical assistance. This monitoring and evaluation plan must include specific, measurable, achievable, relevant, and time-bound indicators that will be used to monitor and evaluate the timeliness and appropriateness of the implementation. The CTCN Technology Manager responsible for the technical assistance will monitor the timeliness and appropriateness of the Response Plan implementation. Upon completion of all activities and outputs, evaluation forms will be completed by the (i) THE COUNTRY on overall satisfaction level with the technical assistance service provided; (ii) the Lead Implementer on the experience and knowledge gained through the technical assistance; and (iii) the CTCN Director on the timeliness and appropriateness of the activities and outputs.

Abbreviations and acronyms

CFC Climate Finance Centre
CIS Commonwealth of Independent States
CTCN Climate Technology Centre and Network
EBRD European Bank for Reconstruction and Development
EU European Union
GCF Green Climate Fund
GHG Greenhouse Gases
HVAC Heating, Ventilation and Air Conditioning
NDA National Designated Authority
NDC Nationally Determined Contribution
NDE National Designated Entity
SNiP Construction Norms and Regulations of the Soviet Union
TA Technical Assistance