



United Nations Industrial Development Organization

## TERMS OF REFERENCE (TOR)

### STRENGTHENING THE CLIMATE CHANGE INFORMATION SYSTEM FOR DECISION-MAKING IN CLIMATE CHANGE VULNERABILITY AND ADAPTATION STRATEGIES IN GUATEMALA

CTCN REFERENCE NUMBER: 2016000031

#### **1 BACKGROUND INFORMATION**

The Climate Technology Centre and Network (CTCN) is the operational arm of the United Nations Framework Convention on Climate Change (UNFCCC) Technology Mechanism and co-hosted by the United Nations Environmental Programme (UNEP) in collaboration with the United Nations Industrial Development Organization (UNIDO) and supported by 11 partner institutions with expertise in climate technologies. The mission of the CTCN is to promote accelerated development and transfer of climate technologies at the request of developing countries for energy-efficient, low-carbon and climate-resilient development.

These requests for Technical Assistance (TA) are being submitted to the CTCN by the National Designated Entity (NDE) of the respective country. The scope of services under these Terms of Reference shall be executed based on a restricted solicitation process, where only accepted Members of the CTC Network, are eligible to submit proposals. Should the bidder partner with another institution to deliver a minor part of the services described in these Terms of Reference, it is expected that the partner institution also joins the CTC Network.

In case you are not a CTCN network member yet, you may bid for implementation of the technical assistance, subject to the condition that you submit your completed application for CTCN Network membership before the last date of the bid closure and the same is acknowledged by the CTCN. Furthermore, the contract award – should your bid be selected – is conditional to your network membership application having been successfully approved by the Director of CTCN.

The maximum budget for this contract is USD 180,000.

#### **2 PROJECT CONTEXT**

Guatemala is located in the tropical zone with greatest exposure to variability and climate change. The country frequently suffers from extreme weather events, causing billions of dollars of damage, especially to the infrastructure, agriculture and health care sectors. Rising temperatures and the increasing frequency and intensity of natural phenomena are expected to have negative impacts on the availability and quality of water, the distribution of plagues and illnesses, land and marine–coastal ecosystems, forest ecosystems and biodiversity, infrastructure, means of human subsistence, cultural identities, traditional and ancestral knowledge, and the soil. The most affected populations are indigenous peoples,



## United Nations Industrial Development Organization

subsistence farmers and traditional fishing communities, including women and children (INDC Guatemala, 2015). To tackle climate change and reduce the country's vulnerability, Guatemala has developed a National Climate Change Policy and the Climate Change Framework Law, establishing the National Climate Change Council, which brings together the country's various sectors. Towards the end of 2016, it also approved the National Climate Change Plan.

In the context of the country's commitments to the United Nations Framework Convention on Climate Change (UNFCCC), Guatemala's Ministry of Environment and Natural Resources (MARN) issued the third communication on climate change, the national greenhouse gas inventory, containing large volumes of information on various sectors. The country is working on the baseline for land-use and land-use change to support the development of the REDD+ strategy. There are also various subnational initiatives to assess vulnerability to climate change and the country is preparing for the first biennial report for the convention. As part of its planning cycle, in its annual operating plan for 2016, MARN proposed establishing an internal monitoring system, with periodic reports on compliance with various environmental requirements, the status of natural resources and issues related to climate change. The annual plan already provides indicators, which can be used as inputs for the planned the National Information System on Climate Change (SNICC) adaptation indicators. A proposal of indicators based on the pressure–state–response matrix is being drawn up in the context of the Institutional Strategic Plan.

Guatemala has the Environmental and Climate Change Information Unit (UIACC), which reports to the MARN Office of Natural Resources and Climate Change under Ministerial Agreement 66–2015 of March 2015. Its functions include developing and managing the MARN's Environmental Information System (SIA) and SNICC. The UIACC is also responsible for inter-institutional coordination to ensure the inputs required for the effective and efficient implementation of both systems. The systems must provide relevant information to support the institutions responsible for reporting to international bodies (e.g. MARN Climate Change Office) to improve sectoral planning (other ministries) and monitor the national adaptation and mitigation action plan.

Guatemala has prioritized the development of climate change metrics and the establishment of the UIACC aims to "provide all the information needed for decision-making and producing national reports in a timely, transparent and fast manner, as well as for producing, updating and implementing plans and instruments derived from Decree 7–2013, such as the national climate change adaptation and mitigation plan, land zoning plans..." (Ministerial Agreement 5–2016). However, the Government of Guatemala does not currently have a national system of robust indicators to measure vulnerability, adaptation and mitigation. While there are subnational initiatives, there is limited coordination between them and the demand for information from decision makers has still not been clearly identified.



## United Nations Industrial Development Organization

Furthermore, there are insufficient national financial, human and technology resources to ensure the effective and efficient implementation of the UIACC. The principal cause of this situation is the high cost of licences for the IT tools and software required to run the systems, as well as the need for capacity-building in using tools and software among the staff responsible for these systems. A third factor hindering system implementation is that its architecture and the information exchange protocols required for analysing, updating, storing and communicating the information have not yet been developed, also due to insufficient human and financial resources.

### 3 AIM OF THE CONTRACT

The main objective is to provide the current initiatives by the institutions and international cooperation to establish a climate change information system with a structural and logical base to facilitate implementation. The expected outcome is that the institutions involved will have a system of indicators on the status of the climate and vulnerability of natural and human systems, as well as the knowledge to include these into an open information platform.

The outputs are:

1. Development of implementation planning and communication documents
2. Set of indicators and their protocols, as well as a proposal for prioritizing the basic products
3. Validation of indicators
4. Transfer and exchange for the implementation of an environmental and climate change information system using open-source tools

### 4 SCOPE AND ACTIVITIES OF THE PROPOSED CONTRACTED SERVICES

To get a better understanding of the objectives of the request for technical assistance, it is recommended that the Contractor refers to the complete Response Plan 2016000031 attached to this tender (original in Spanish; translated copy in English). Particular attention should be paid to the following sections: Linkages to relevant parallel ongoing activities, main in-country partners, Gender and co-benefits, Anticipated follow-up activities. Regarding section 4 of the response plan, please take into consideration that the estimated budget breakdown is presented on an indicative basis.

Please note that activities 5 and 6 of the response plan are not part of this ToR. CTC, in coordination with the NDE, will make the effort to identify an opportunity to work with another international cooperation body to fund these activities.

Once the Contractor is contracted, the CTCN will organize a kick-off implementation call between all parties involved in implementation to introduce the Contractor to the Guatemalan NDE (also proponent of the CTCN request), present the activities and timeline, and clarify the roles and responsibilities.



United Nations Industrial Development Organization

**Output 1: Development of implementation planning and communication documents**

Activity 1.1: Development of monitoring and evaluation documents for the following activities:

Activity 1.1.1: A detailed work plan of all activities, deliveries, outputs, deadlines and responsible persons/organizations and detailed budget to implement the Response Plan. The detailed work plan and budget must be based directly on this Response Plan;

Activity 1.1.2: 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 activity 1.1.4 below and section 14 in the Response Plan);

Activity 1.1.3: A two-page CTCN Impact Description formulated in the beginning of the technical assistance and updated/revised once the technical assistance is fully delivered (a template will be provided);

Activity 1.1.4: A Closure and Data Collection report completed at the end of the technical assistance (a template will be provided).

Activity 1.2: Systematization of relevant experiences

Identify, document and analyse relevant experiences in other countries with national climate change and environment measurement systems to produce a practical guide or list of recommendations for Guatemala. Systematization will be based on CTCN work as part of technical assistance for Colombia in 2015.

**Deliverable output 1:**

- *Detailed work plan (in English)*
- *Monitoring and evaluation plan (in English)*
- *CTCN Impact Description (in English)*
- *Closure and Data Collection report (in English)*
- *Document on relevant experiences in other countries and recommendations for Guatemala (in English and Spanish)*

**Output 2: Set of indicators and their protocols, as well as a proposal for prioritizing the basic products**

Activity 2.1: Drawing up the conceptual framework

A conceptual framework will be drawn up showing the possible information flows required for the adaptation and climate science components of the SNICC and possible sources and consumers of this information. This will be based on an initial proposal of currently documented environmental indicators (to be provided by the proponent), lessons learned from CTCN technical assistance in Colombia and Chile (for more information, see the corresponding pages on the CTCN website), a literature review, documentation of the country's previous commitments in international agreements and conventions,



## United Nations Industrial Development Organization

national commitments (e.g. National Action Plan for Climate Change, Intended Nationally Determined Contributions, Sustainable Development Goals, the K'atun 2032 National Development Plan and the State Environmental Report) and preliminary discussions with decision makers. This will result in an initial list of key questions for defining the set of indicators for these two components.

### Activity 2.2: National consultations and analysis of the supply of and demand for information

Interviews and meetings with staff responsible for managing information and making decisions in different priority sectors. This will define information needs for specific decisions in specific sectors, desirable properties of information products and information that is currently generated and that could potentially be related to priority indicators for vulnerability, adaptation, mitigation and climate science components. This will result in a series of generating questions to which the indicator system should respond.

### Activity 2.3: Producing a technical proposal for the information system

In coordination with the proponent, the implementing organization will combine the results of activities 2.1 and 2.2 to produce a technical proposal for the information system for vulnerability, adaptation and climate science, with a set of priority indicators, priority information products, information available for implementing the system and proposals for mechanisms to generate the data required for the priority indicators that do not yet have consistent and reliable data. Regarding the available information and the data required, the proponent will share the diagnostics by the United Nations Development Programme (UNDP) for the environmental information system and Gesellschaft für Internationale Zusammenarbeit (GIZ) for the SNICC (both carried out in 2016) with the implementing organization.

### Activity 2.4: Sectoral workshops and meetings to validate the technical proposal

The final review of the various aspects of the technical proposal will take place during these workshops and meetings. Participants in the workshops will include:

- representatives of inter-institutional committees
- institutions and organizations to be identified by MARN, which will include groups of potential users such as the Inter-institutional Coordination Group (CGI), which comprises MARN, the Ministry of Agriculture, Livestock and Food (MAGA), the National Forestry Institute (INAB) and the National Council of Protected Areas (CONAP)
- National Coordinator for Disaster Production (CONRED), which brings together state and private institutions, as well as NGOs
- National Presidential Council for Climate Change
- National System for the Prevention and Control of Forest Fires (SIPECIF)
- relevant ministries (e.g. Ministry of Health and Ministry of Communications, Infrastructure and Housing)

NGOs and private organizations (e.g. Red Cross, environmental NGOs, university research institutes and centres).

### **Deliverables output 2:**

- *Narrative description of the conceptual framework showing the potential information flows required for the adaptation and climate science components of the SNICC, as well as potential sources and consumers of this information (in Spanish)*



## United Nations Industrial Development Organization

- *State diagnostic of the management of information on the environment and climate change by the public sector in decision-making (demand, availability, gaps and proposals to fill them), alongside a list of people interviewed (in Spanish)*
- *Technical proposal for the information system (including the set of indicators, outline of information products, content protocols for indicators and identification of protocols required for exchanging data between bodies) that takes into account the results of the sectoral workshops and validation meetings (in Spanish)*
- *Reports on sectoral workshops and meetings (activity 2.4) (in Spanish)*

### **Output 3: Validation of indicators**

#### Activity 3.1: Developing protocols for measuring and gathering data

Based on the experiences of CTCN technical assistance in Colombia, protocols containing the following information will be developed for each indicator defined:

- sectors for which the indicator is relevant
- relevance of the indicator (why it is included)
- objective of the indicator
- variable being measured
- who developed or proposed the indicator
- geographic and temporal coverage
- unit of measurement
- data sources
- how often it must be updated
- conceptual framework of the measurement method
- how it is calculated
- how the result is interpreted
- limitations
- documents reporting its previous use.

#### Activity 3.2: Trial implementation of the proposed indicators

To verify the feasibility of obtaining the information required to measure the proposed indicators, a national consultant will be hired to apply the protocols developed under activity 3.1. For each indicator, the consultant will evaluate how useful the protocol is and how easy it is to obtain the data. The consultant will also identify limitations in the data-collection process and in the indicator itself.

#### **Deliverables output 3:**

- *Measurement protocols (in Spanish)*
- *Values of indicators and their validation (in Spanish)*

### **Output 4: Meeting of experts: transfer and exchange for the implementation of an environmental and climate change information system using open-source tools**

#### Activity 4.1: State-of-the-art review of development and uses of environmental and/or climate change information platforms

Review of published documentation on the development and use of environmental and/or climate change information platforms for decision-making. As an input, the implementing organization will have



## United Nations Industrial Development Organization

the diagnostic made by GIZ (Regalado and Araujo 2015, draft) on platforms for Guatemala. This should be complemented by specific experiences (positive and negative) from other countries and a diagnostic currently being produced by REDD+.

Production of a publishable document with recommendations for Guatemala.

Tentative list of open-access resources whose application in Latin American countries should be exhaustively reviewed:

### **For creating spatial databases:**

- \*- PostgreSQL
- \*- PostGIS
- \*- Oracle Spatial
- \*- My SQL/ Fusion Tables

### **For web mapping:**

- \*- Geoserver
- \*- Geoserver Cache
- \*- Open Layers
- \*- Leaflet

### **For creating web map services (WMS):**

- \*- QGIS Server

### **Creating spatial data infrastructure:**

- \*- Mapbox
- \*- CartoDB
- \*- JavaScript

### **Gathering field data:**

- \*- Open collect

### Activity 4.2: Preparation of an international meeting for exchanging experiences

Based on the review of existing platforms (including the results of the LEDS programme exchange workshop in March–April 2017), and in coordination with experts chosen from different countries, develop content for the meeting of experts and identify and invite information and technology experts. The intention is to exchange experiences and ideas on architecture, software, forms and protocols for information exchange, as well as lessons learned in developing and implementing environmental information systems. In Guatemala, experts from various government bodies (e.g. MINFIN, SEGEPLAN, INAB, IGN, INE, MARN, CONAP and INSIVUMEH, as well as projects such as LEDS), private organizations (e.g. ICC), academic institutions and civil society organizations will be invited. At the international level, experts from a maximum of four Latin American countries and one or two other countries will be invited (experts must speak Spanish).

### Activity 4.3: International meeting for exchanging experiences and lessons learned

Holding the international meeting of experts for transferring and exchanging good practices for environmental and climate change information platforms (e.g. monitoring biodiversity in Chile, national system of adaptation indicators, the Colombian Environmental Information System (SIA), SINAMECC in Costa Rica). The state-of-the-art report and the topics agreed with experts from different countries (activities 3.1 and 3.2) will form inputs for the meeting. The results of the meeting and lessons learned will be summarized with recommendations for Guatemala.



## United Nations Industrial Development Organization

### Deliverables output 4:

- *Technical state-of-the-art report on the use of environmental and/or climate change information platforms for decision-making (primarily focused on the use of open-source platforms) (in Spanish)*
- *Workshop report with recommendations for Guatemala and list of participants (in Spanish)*

## 5 GENERAL TIME SCHEDULE

The activities under this contract should be completed within a period of nine to ten months from the date of signature of the Contract.

## 6 PERSONNEL IN THE FIELD (PROFESSIONAL EXPERIENCE AND QUALIFICATIONS)

The Contractor is expected to provide the services of a team that should ideally comprise the following competencies:

- Proven experience and in depth expertise in the design and use of climate change monitoring systems in Latin America, definition of relevant indicators and creation of enabling structures
- Proven experience in the identification of adaptation and mitigation indicators, definition of indicators measurement protocols and production of digital cartography to represent indicator trends
- Proven experience in organizing workshops and interviews with senior figures in ministries and state institutions in the country
- Proven experience in the design and use of geoinformatics systems using a wide range of tools for information sharing (including open-access, spatial data infrastructure, other web mapping applications and application development).
- The staff assigned to the project must have previous experience and qualification of supporting climate projects and technical assistance, in Latin America and preferably in Guatemala.
- Team members should hold advanced degrees in their respective areas of expertise and be fluent in both English and Spanish.
- Very good conceptual and writing skills

The CVs of the respective experts assigned to this project by the Contractor must be provided.

## 7 LANGUAGE REQUIREMENTS

The working language for the purposes of this project is Spanish, thus an excellent command of Spanish is required of the proposed personnel. The deliverables must be submitted in the language(s) specified above.

All delivered documents must be of such a quality that no further editing shall be required.





United Nations Industrial Development Organization

**8 DELIVERABLES AND SCHEDULE**

The table below details the indicative schedule for this assistance. This schedule can be revised in the contractors' proposal.

Activities	Delivery date (after contract start date)
<b>Output 1: Development of implementation planning and communication documents</b>	
Detailed work plan (in English)	Month 1
Monitoring and evaluation plan (in English)	Month 1
CTCN Impact Description (in English)	Month 1 and Month 10
Closure and Data Collection report (in English)	Month 10
<b>Output 2: Set of indicators and their protocols, as well as a proposal for prioritizing the basic products</b>	
Narrative description of the conceptual framework showing the potential information flows required for the adaptation and climate science components of the SNICC, as well as potential sources and consumers of this information (in Spanish)	Month 3
State diagnostic of the management of information on the environment and climate change by the public sector in decision-making (demand, availability, gaps and proposals to fill them), alongside a list of people interviewed (in Spanish)	Month 3
Technical proposal for the information system (including the set of indicators, outline of information products, content protocols for indicators and identification of protocols required for exchanging data between bodies) that takes into account the results of the sectoral workshops and validation meetings (in Spanish)	Month 4
Reports on sectoral workshops and meetings (activity 2.4) (in Spanish)	Month 4
<b>Output 3: Validation of indicators</b>	
Measurement protocols (in Spanish)	Month 5
Values of indicators and their validation (in Spanish)	Month 7
<b>Output 4: Meeting of experts: transfer and exchange for the implementation of an environmental and climate change information system using open-source tools</b>	
Technical state-of-the-art report on the use of environmental and/or climate change information platforms for decision-making (primarily focused on the use of open-source platforms) (in Spanish)	Month 9
Workshop report with recommendations for Guatemala and list of participants (in Spanish)	Month 9