FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
Terms of Reference for 1 years for a category B

Job Title:	International Consultant- Climate Change Data, Remote Sensing and GIS Analyst.
Division/Department:	FLJAM
Programme/Project Number:	GCP/BZE/002/GCR - Enhancing adaptation planning and increasing climate resilience in the coastal zone and fisheries sector of Belize.
Duty Station:	Belize
Expected Start Date of Assignment: December 1, 2022	**Duration:** 60 days (WAE) @ 400 USD/day From December 1, 2022 to March 31, 2023.
Reports to: **Name:** Crispim Moreira	**Title:** FAO Representative for Jamaica, Bahamas, and Belize

* Please note: If this TOR is for Consultant / PSA.SBS contract, the minimum relevant experience required **for the assignment** is as follows:
1 year for a category C;   5 years for a category B;   12 years for COF category A;   15 years PSA or COF category A (World Class Expert);

BACKGROUND, OBJECTIVE TO BE ACHIEVED AND GENERAL DESCRIPTION OF TASK(S)

Belize, a small island developing state is particularly vulnerable to the impacts of climate change owing to it low coastal region (below high tide mark), the rapid economic development in the coastal region and population increase. The fisheries and coastal zones sectors of Belize, which contribute significantly to the national economy, in regard to food security and in providing valuable tourism opportunities, are threatened especially to sea level rise and storm surge as well as rising sea surface temperatures.

The Government of Belize, in its NDC, identified coastal and marine resources and fisheries and aquaculture as priority sectors requiring increased resilience and reduced vulnerability; however, the following barriers were identified:

•   Need for increased capacity building, education, and awareness around adaptation planning and at various levels including community level

•   Insufficient technological capacity to undertake effective research on climate modelling and risks

•   Research and monitoring for high-quality scientific information including climate data

•   Need for enhanced coordination in implementation of legislation and policy

•   Lack of Finance to implement adaptation activities

The Government of Belize is undertaking a Green Climate Fund (GCF) readiness project entitled, "Enhancing adaptation planning and increasing climate resilience in the coastal zone and fisheries sector of Belize". This project aims to set the stage for a more large-scale action to be taken to address climate change adaptation in the fisheries and coastal zone sectors of Belize. This readiness project seeks to increase the resilience of the coastal zone and fisheries sector through improved climate data and information gathering, monitoring and dissemination, assessments of impacts of climate change on select communities, mainstreaming of climate change considerations into the relevant plans and policies and strengthening of coastal and fisheries communities and organizations communication network for appropriate climate response.

The activities under this readiness will provide important baseline information to build coastal resilience and improve adaptive capacity for fishing communities. Data gathered through the readiness project will be vital to develop the climate rationale for fisheries and coastal zone projects for the GCF and overall climate change projects. The data gathered will illustrate the high vulnerability of fisheries sector and coastal areas of Belize and the need to increase resilience to ensure the viability of the fishing industry and the livelihoods, well-being, and safety of the stakeholders.

Objectives:

1. To build capacity of the Coastal Zone Management Authority and Institute (CZMAI), The Belize Fisheries Department, The National Meteorological Service of Belize, The Blue Economy Unit under the Ministry of Blue Economy and Civil Aviation and other national stakeholder identified for the tracking ecosystem health and forecasting future climate change impacts, including the use of innovative technologies such as drones and remote sensing tools.
2. To develop pre and post evaluation survey of participants on skills for tracking ecosystem health and forecasting climate change impacts.
3. To conduct three 4-days training workshops for 15 participants each per workshop.

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General Description of Task:

1. **Evaluation survey of stakeholder capacity needs, workplan and power point presentation.**
   - Provide workplan which clearly highlight training dates and needed equipment/apparatus required.
   - Developing a pre and post evaluation survey of participants to determine level of skills in tracking ecosystem health and forecasting future climate change impacts.
   - Utilization of pre-survey results to refine the training modules.
   - Determine the categorization of the stakeholders to govern the best level of training needs for each training module.
   - The scope of services in this consultancy shall comprise: 1. Facilitate in developing the training modules and session plans in the suggested thematic areas indicated in Table 1 (Please see below). During the module development, the consultant will liaise with respective stakeholders, departments and agencies to avoid any duplication in the case of similar material. The consultant will ensure that the materials developed are consistent with the capacity needs required by the stakeholders. Any supporting materials identified as necessary for the achievement of training should be included in the document. The draft modules will be reviewed by experts and therefore, the consultant will incorporate and revise the modules to the required acceptable standards.
   - Prepare a power point presentation in English language, which shall be presented to the project steering committee and the multi-stakeholder engagement committee of the coastal zone areas and fisheries sector of Belize based on the first evaluation survey results and final topic/thematic areas.

2. **Organize and provide training for 3-4 days training workshop.**
   - Conduct three four-day training workshops in Belize City for 15 participants to build institutional capacity within the Coastal Zone Management Authority and Institute (CZMAI), the Belize Fisheries Department, the National Meteorological Service of Belize (NMSB), The Blue Economy Unit under the Ministry of Blue Economy and Civil Aviation and other national relevant stakeholder identified for tracking ecosystem health and forecasting future climate change impacts.
   - The use of innovative technologies such as drones and remote sensing tool is a requirement.
   - The training must focus on thematic areas of data assimilation, climate model development, seasonal climate outlook for fisheries forecast, effective monitoring of coastal areas eco-system health and forecasting of climate change impacts.
   - The production of the climate outlooks, forecast etc. shall be produced by the NMSB. Sector specific products such as outlook for the fisheries and CZMAI can be co-produced, done by NMSB with inputs form the sector to ensure information is relevant and meets the user needs. This downscales outlook should be designed to be compatible for sharing on the NMSB and CZMAI website and stakeholder's social media platforms.

3. **Reports and Training Manual.**
   - Document and compile all training documents, activities and provide a report for each training. Ensure that pictures are included.
   - Develop training manuals documenting concise methodologies for each training module and training workshop.
   - It is expected that the training manual must clearly identify the type of data (especially marine climate and ecosystem health data) needed to carry out specific objectives.

TABLE 1: SUGGESTEDTOPICS/THEMATIC AREAS.

Training Session	Date	Days	Course Content	Attendees
1	**TBA**	**2**	**Module 1: Introduction to GIS**	Beginners-Intermediate
			Topics: • GIS data types (vector and raster) • Introduction to feature class (point, line, polygon) • GIS file types (File Geodatabase, Feature Class, Shapefile, Table, GeoTiff) • Projections & Coordinate systems (geographic and projected) • Introduction to Geoprocessing tools for tracking ecosystem health • Data Transformations and corrections • Working with attributes tables	

		2	**Module 2: Data Science + Climate Change**	Beginner-Intermediate
			Topics: ● Acquiring, getting and processing climate data ● Types of climatic data ● Important insights from Climate History ● Foundations for the statistical analysis of climate change ● Analysing Climate TRACE Global Greenhouse Gas Emissions Data ● Spatial Temporal Mapping ● Application of GIS in assessing future climate outlooks ● Limitations of using open-source data	
2	TBA	2	**Module 3: Climate Data Analysis and Visualization**	Intermediate
			Topics: ● Able to write simple shell scripts to automate processes and combine the functionality of several programs to complete a task. ● Plot geospatial data using symbols, contours or a colour mesh with a suitable map projection, scale and colour scale. ● Training in the use of GIS for Climate Data Manipulation, Visualization and Modelling. ● Training in Linux Administration and Network Configuration ● Utilizing Remote Sensing techniques for effective monitoring of coastal areas for ecosystem health and forecasting climate change impacts.	
		2	**Module 4: Introduction to Remote Sensing & Climate Change for the Coastal and Fisheries Sector**	Intermediate
			Topics: ● Principles of Remote sensing ● Principles of remote sensing on the Atmosphere and Oceans. ● To use relevant Earth- and space-based remote sensing to observe atmospheric and surface phenomena qualitatively and quantitatively. ● Utilize remote-sensing technology in making earth observations. ● Training on how active sensing systems such as radar, LiDAR and sound detecting and ranging (SODAR) are used to provide quantitative and qualitative data about atmospheric parameters (for example, precipitation rate and type, wind speed and direction, cloud, humidity, temperature, turbulence, and aerosol loading) and phenomena (such as thunderstorms and microbursts). ● Training on how data from passive sensors are used to derive information such as temperature, humidity, atmospheric composition, lightning, wave heights and soil moisture.	

3	TBA	2	**Module 5: Advance Remote Sensing & Climate Change for Coastal and Fisheries Sector**	Intermediate-Advance
			Topics: ● Geospatial interpolation of Climate Parameters ● Climate GIS Models and Modelling Climate Change. ● Future Climate Change and Projected Impacts. ● Climate Change Adaptation strategies using GIS and Remote Sensing.	
		2	**Module 6: Data Management and Marine Spatial Data Infrastructure focused on Climate Change data**	Intermediate-Advance
			● Open Data and Data Sharing ● Standards and Interoperability ● Integrations with existing systems ● Architecture and Platforms ● Security, Privacy and Safety ● Funding and Investment of MSDI	

Qualifications and Experience:

- Minimum of a Master's degree in Climate Science, Climatology, Remote Sensing, Geographic Information Systems or equivalent to Climate Change Analyst or a similar field from recognized and reputable institutions.
- A minimum of 5 years of relevant working experience and expertise in providing trainings in the sectors of focus for this assignment as well as experience working with projects supported by international organizations and donors, such as UN agencies, GCF, NGOs etc.
- Experience in Small Island Development States and the Caribbean.
- Experience with the use of GIS for Climate Data Manipulation, Visualization and Modelling.
- Experience working on climate change adaptation projects is a plus.
- Excellent analytical, writing, advocacy, presentation, and communications skills are required.
- Excellent written and oral communication skills in English.
- Knowledge of the fisheries and coastal zone sectors and use of remote sensing and drone technology as it relates to the effects of climate change in regard to adaptation/resilience and mitigation.

KEY PERFORMANCE INDICATORS	
Expected Outputs:	Required Completion Date:
1. Evaluation of stakeholder capacity and needs via pre-training survey based on the level of skill and capacity of each stakeholder and post-survey based on the skills and knowledge attained after via training workshop (Deliverable 3.1.4b). A.) Prepare a power point presentation in English language, which shall be presented to the project steering committee and the multi-stakeholder engagement committee of the coastal zone areas and fisheries sector of Belize based on the first evaluation survey results and final topics/thematic areas.	No later than 30 after signing contract
2. Conduct three four-day training workshops in Belize City for 15 participants to build institutional capacity within the Coastal Zone Management Authority and Institute, the Belize Fisheries Department, the National Meteorological Service of Belize, The Blue Economy Unit under the Ministry of Blue Economy and Civil Aviation and other national relevant stakeholder identified for tracking ecosystem health and forecasting future climate change impacts (Deliverable 3.1.4a).	40 days after signing contract
3. Final training manual and reports for training workshops.	60 days after signing contract

> Below is link to project document:

https://www.greenclimate.fund/sites/default/files/document/enhancing-adaptation-planning-and-increasing-climate-resilience-coastal-zone-and-fisheries-sector.pdf

> Interested candidates meeting the required qualifications are invited to send their application to Jeffy.Gomez@fao.org before November 15, 2022.