

## **Terms of Reference**

### **TRAINING CONSULTANCY**

#### **Integrating Geographic Information System, Global Positioning System and Information Technology in Sustainable Land Management**

##### **1. BACKGROUND**

Land degradation is increasing in severity and extent throughout many parts of the tri-land state of Grenada. Defined as the long term decline in ecosystem function and productivity in forest, agricultural and other terrestrial ecosystems, this issue of global importance is threatening the livelihoods of vulnerable communities, and hindering efforts at sustainable growth and development. Credible up to date information however, on the extent of land degradation in Grenada is not available. In fact, there is no formalized and systematic system instituted at the national level to monitor land degradation occurrence. Although field officers attached to the key land management agencies observe potential land degradation hazards and/or actual events during routine activities, no protocol exists to document these temporal variability in land resource quality and/or integrate this data into land management planning.

Strengthening capacity for detecting and monitoring changes in land conditions is critical to support the development of conservation strategies for long term sustainability of land resources. Technical officers and planners need to be aware of the indicators of land degradation, and be trained to collect data of these events as part of an overall framework for sustainable land management (SLM). Approaches to monitor land degradation have traditionally been based on remotely sensed estimates of vegetation production. However, current information and best practice recommend that large scale monitoring of the environment is best served through utilization of a range of innovative technology solutions, including Geographical Information System (GIS), Global Positioning System (GPS) and multimedia. It is therefore critical that field officers involved in land management be equipped with the skills and tools necessary to monitor changes in the landscape, and integrate the resultant information in the existing Grenada Land Information System<sup>1</sup> to support wise management of land.

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<sup>1</sup> The GLIS located in the Land Use Division, Ministry of Agriculture represents the principal repository for land information in Grenada. It is a PC-based information platform designed to facilitate rational and efficient land use planning at national and sub-national levels. The state of the art system consists of a number of geographically referenced data that use GIS to show spatial distribution.

The Government of Grenada through its *Capacity Building and Mainstreaming of SLM Project*<sup>2</sup> is therefore seeking a specialist to train land management officers to monitor land degradation and potential land use practices that induce this phenomenon through the use of GIS, GPS and IT technologies. This training will also provide the skill set needed to improve the temporal variability of the databases contained in the Grenada Land Information System (GLIS).

## **2. OBJECTIVES**

The proposed training builds on a previously conducted capacity building activity spearheaded by the Ministry of Agriculture in 2008. It seeks to provide the knowledge and skills needed to improve the efficiency of land management through the integration of GIS, GPS and multimedia technologies. Specifically, the training should

- (1) Introduce a spatial database management system that will include GIS optimization techniques; identifying and mapping environmentally sensitive locations and other significant structures using GPS technology; clarifying and cataloging land use and cover; integrating geocoded panoramic and profile photographs to GIS maps for viewing through a common Internet platform such as Google Earth.
- (2) Build capacity for continuous monitoring of changes in the environment by integrating environmental reports with GIS, including statistical summaries; creating predictive models for disaster management; collecting and sharing near real time data; learning how to deal with uncertainty in spatial data and understand how uncertainty can be propagated through conception, measurement and analysis.

## **3. THE ASSIGNMENT – SCOPE OF WORK**

The consultant will be required to:

- a. Prepare a training plan including step by step manual to achieve the objectives as outlined in 2.0 above.
- b. Finalize the training plan in consultation with the Ministry of Agriculture.

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<sup>2</sup> Funded by the United Nations Development Programme, the Global Environment Facility and the Government of Grenada, the long term goal of the project is to ensure that the agricultural, forest and other terrestrial land uses of Grenada promote sustainable systems that maintain ecosystem productivity and ecological functions while contributing to the environmental, economic and social well being of the country.

- c. Administer the training as prepared above to stakeholders selected by the Ministry of Agriculture.
- d. Prepare a workshop report that assesses the implementation of the activity. The report should highlight the Consultant's and participants overall perspective of the activity, limitations of the training, strengths and weaknesses, and recommendations for improving similar training sessions in the future. The report should also propose a plan developed in consultation with training participants that outlines a mechanism for institutionalizing an ongoing land degradation monitoring programme in Grenada using the skill sets obtained from the training.

#### **4. OUTPUTS**

The Consultant is expected to deliver the following outputs:

- a. A training plan including timeline within two weeks after signing the contract.
- b. A training report which summarizes the training administered, issues raised and the plan for institutionalizing land degradation monitoring as discussed above within 2 weeks subsequent to completion of the activity.

#### **5. PROJECT MANAGEMENT AND ADMINISTRATION**

The Project Management Unit based in the Ministry of Agriculture will administer this contract in collaboration with the PSC. All communications regarding this assignment will be referred to the Project Manager of the PMU.

The PMU will facilitate the work of the consultant by planning all the logistics regarding the training at the national level. This includes inviting participants, organizing venue etc. The Consultant would be required to submit in a timely manner as agreed with the PMU all resources for printing relevant to the training. The Land use Division, Ministry of Agriculture will provide some hardware and software support including personnel during the training as agreed in consultation with the Consultant.

The Consultant will manage his/her time and responsibilities to ensure timely delivery of the outputs required under this Terms of Reference.

#### **6. QUALIFICATIONS AND EXPERIENCE OF CONSULTANT**

The successful Consultant should possess at least a Masters Degree in GIS, Geography, or other related field with over 5 years experience in training stakeholders to use GIS, GPS and associated technologies for land degradation monitoring.

## **7. TIMING**

It is anticipated that the contract will be undertaken during the month of November 2009 at a date agreed on between the Consultant and the PMU.