



WMO



IGAD



EC

Intergovernmental Authority on Development (IGAD) – Hydrological Cycle  
Observing System (HYCOS) Project – IGAD-HYCOS

## DESIGN DATA TRANSMISSION SYSTEM FOR IGAD-HYCOS

### TERMS OF REFERENCE

#### 1. Background

The IGAD-HYCOS project, promoted by IGAD, is one component of the Inland Water Resources Management Programme (INWRMP). The project is aimed at establishing a “*Regional water management information systems and strengthened observation networks*” within the broader framework of the Inland Water Resources Management Programme (INWRMP).

The IGAD-HYCOS project will be implemented as a two Phase project entitled “Implementation of the IGAD HYCOS”. The implementation period for Phase I (preparatory phase) of the project is twelve months and it commenced in June 2011.

The preparatory phase of the “Implementation of IGAD-HYCOS” will focus on revision of the project document and preparatory activities for the implementation phase (Phase II). It will involve extensive country consultations with all relevant stakeholders. The revision of the document is necessary because the existing project document was compiled in 2003 (with preliminary budget estimates) keeping in view the then state of telecommunication systems and the available data transmission technology in the Region. As per the original proposal only, Djibouti, Eritrea, Ethiopia, Kenya, Somalia, Sudan and Uganda – Members of IGAD - were included as the participating countries in the project. Now, at the request of East Africa Community (EAC) and considering the new political changes in the Region, the scope of the project has been extended to cover additional countries including Burundi, Rwanda and South Sudan. The revised draft project document will be aligned with the new on the ground realities to ensure successful implementation of the project.

The IGAD region is characterised by water related disasters. They include periodic subsequent flash floods and droughts. All these cause devastating damages and loss of lives. These losses could be minimized if there is reliable information provided to the planners and decision makers in appropriate time. To produce such reliable information hydrological data need to be transmitted in a real-time or near real-time to support early warning systems.

Presently, within the IGAD region, most of the National Hydrological Services (NHSs) are lacking appropriate real-time or near real-time data transmission systems, sufficient technical and institutional capacity to manage timely and accurate hydrological information to enable the efficient and economic management of their national water resources. There is need for support to the NHS to strengthen their capacity to better fulfil their responsibilities, by improving the availability, accuracy, and dissemination of water resources data and information. This will be achieved through the development and implementation of appropriate national water resources information systems which will facilitate the use of the data and information in support of sustainable socio-economic development.

The IGAD-HYCOS project, therefore, is designed to promote sustainable and integrated water resources development and management in the IGAD region through enhancement of regional

cooperation and collaboration in dissemination and exchange of hydrological and hydro-meteorological data and information for water resources assessment, monitoring and management. For that purpose the project aims at establishing adequate data transmission system to support regional cooperation in information exchange among the IGAD countries. The project is expected to provide the IGAD region with a hydrologic information system that will feed into a regional water information system, and will assist participating countries in developing their national capacities for more efficient, cost-effective and sustainable water management. To achieve this task there is a need to have a modern and reliable data transmission system for data transfer a real-time or near real-time for producing useful and reliable information to decision makers, planners and end users.

## **2. Purpose**

In this era of information and communications technology, there exists a wide range of data communications options from long-range wireless satellite communications to short-range Bluetooth wireless technology. Various manufacturers of hydro-meteorological systems adopt various Telemetry options each with their own unique characteristics which will govern which applications they are most suitable for. Data telemetry can simplify and speed the acquisition of critical information from remote locations. Remote telemetry systems take advantage of the latest wireless communication systems to create integrated environmental data collection solutions.

Designing a complete Hydrological Information System requires establishment of an effective data transmission system for transmitting the information in real-time or near real-time to the decision makers and end users.

In this instance, a primary focus of the development of the Regional and National Information system will be strengthening national data transmission system and a establishing regional one in support of the implementation of the Inland Water Resources Management Programme (INWRMP). Noting this however, countries will need to identify a suitable national data transmission system which can be maintained and sustained and also meet their national needs..

The IGAD-HYCOS will need to establish a data transmission system, suitable to the region and based on the available telecommunication facilities/systems in the countries (access to WMO Information System (WIS), extent of cellular telephone networks, etc) and their suitability to meet the data transmission requirements (e.g. minimizing the disruption to data flow in cases of extreme events, etc.) and this should be designed by an expert in data transmission systems.

The services of a qualified and highly competent consultant will be required to assist the Project Manager in designing the most suitable data transmission system for IGAD-HYCOS. The purpose of these Terms of Reference is to guide the Consultant in the process of designing the required data transmission system for the IGAD Region, and any special cases that merit consideration for inclusion in the IGAD-HYCOS Water Information System. This will be carried out in consultation with the Member States, guided by the following objectives:

- Hydrological data transmission capabilities, suitable to the region and based on the available telecommunication facilities/systems in the countries/region.
- Responsive to data transmission requirements (e.g. minimizing the disruption to data flow in case of extreme events, etc.)
- Simplify and speed the acquisition of critical information from remote locations.
- Take advantage of the latest wireless communication systems to create integrated environmental data collection solutions.
- Be robust, sound, maintainable and sustainable at national and the regional levels.

Among the data communications options, there are various systems using modern technology. These systems need to be investigated to select the most suitable ones for the purposes intended. These systems include, but are not restricted to, the following:

- The Global System for Mobile Communications (GSM) which is an international digital cellular telecommunications standard.
- GPRS/EDGE/HSDPA (3G) Modems based on packet switched data transmission using TCP/IP Protocols.
- Radio Communications including Satellite communication and Wireless communication
- Landline Modems
- Internet

The Data transmission System for the IGAD-HYCOS project will be the one which provides the highest level of cost effectiveness and communicates the data in near real-time taking into account the available infrastructure.

### **3. Scope of Work**

The consultant, in collaboration and close coordination with the Project Manager and the National Focal Points, shall carry out the following activities:

- a) Consult the necessary relevant IGAD-HYCOS documents, including but not limited to, the old Project document (2003 version), IGAD/EU Financing Agreement, WMO/EU Contribution Agreement, as well as the completed Questionnaires received from the countries;
- b) Establish good working relationships with all IGAD-HYCOS countries;
- c) Identify the data elements to be transmitted in real time and those to be translated in near real time
- d) Establish existing and proposed data transmission options in the hydro-meteorological systems installed/to be installed in each country.
- e) Study the telecommunications infrastructure in each country and for each option consider and comment on:
  - The national radio communications regulatory procedures
  - The installation, maintenance and running costs
  - The compatibility of the option with the telecommunications infrastructure of the country
- f) Based on the outcome of the above, design the most cost effective data transmission system compatible with the data collection in the national network for each country.

- g) Design a network maintenance programme.
- h) Facilitate discussions on the IGAD-HYCOS data transmission system at the National Stakeholders workshop.

#### **4. Deliverables and Outputs**

The Consultant shall submit to the Project Management Unit (PMU) three hard and soft copies of the following deliverables:

- Draft detailed Report on proposed Data Transmission System including:
- Final Report after receiving comments from WMO, IGAD and countries.

#### **5. Qualifications**

To fulfil the requirements of the above scope of work, the Consultant should have the following qualifications:

- a) Extensive experience in telecommunications especially hydrological data transmission systems. (minimum 10 years)
- b) Knowledge of Integrated Water Resources Management, preference will be given to firms and individuals with IGAD Region experience
- c) Good Knowledge of data management systems; hydrological observation networks and instrumentation
- d) University degree or equivalent in the relevant field

#### **6. Selection Criteria**

The most suitable applicant will be selected on the basis of an evaluation of the applicants against the following criteria:

- a) Qualifications;
- b) Experience in telecommunications;
- c) Experience in hydrological data transmission systems
- d) Experience in designing hydrological data and information management systems
- e) Quality of the proposal for work
- f) Knowledge of the IGAD-HYCOS countries and their hydrology
- g) High level communication skills
- h) The cost estimate for doing the job
- i) Availability to commence duties

#### **7. Time Frame**

The expected time frame for the Consultant to complete these activities is 3 months.

#### **8. Financial Arrangements**

A contract in the form of a Special Service Agreement (SSA) for 30 working days with the WMO will be offered to the consultant to finish the tasks in the three month period. The level of the payment will be based on the qualifications and experience of the successful applicant.

## 9. Procedures for Applying

Interested experts who have the qualification to do the job are encouraged to submit the following document to the Project Management Unit (PMU):

- a) An up-dated and recent C.V. addressing the selection criteria above
- b) A detailed proposal for the workplan indicating the work to be done for achieving the task, main points to be discussed with the countries and to also be addressed in your report, plan for visiting countries, the structure of your final report.
- c) An estimate of the proposed financial costs for the activities highlighting separately, the consultancy professional fee (Lump sum) and expected cost of at least four missions to visit four countries in the region, each for four days.

The above documentation should be submitted by e-mail to the Project Management Unit (PMU) at [pmunairobi@wmo.int](mailto:pmunairobi@wmo.int) and copied to [mtawfik@wmo.int](mailto:mtawfik@wmo.int)

The closing date for receiving applications is **17 December 2011.**

### **IMPORTANT NOTICE:**

1. ONLY APPLICATIONS RECEIVED BY E-MAIL WILL BE CONSIDERED (HAND DELIVERY OR POST THE APPLICATIONS WILL NOT BE ACCEPTED)
2. APPLICATIONS SENT OR RECEIVED AFTER THE DEADLINE WILL NOT BE CONSIDERED