

Sudan / Soudan

(246)

UNITWIN/ UNESCO Chairs Programme

Progress Report

Period of activity: 2008-2009

UNESCO Chair in Water Resources

**Report established by: Prof. Abdalla Abdelsalam Ahmed, UNESCO
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I. Activities

1. Education/ Training/ Research

In 2008-2009, the UNESCO Chair offered education and training activities and conducted research projects in the fields of:

- Water Resources Planning and Management
- Hydrology and Hydraulics
- Irrigation Management
- Reservoir Sedimentation
- Water Harvesting
- Socio-economic and Environmental Assessment
- Remote Sensing and GIS
- Soil Science and Agronomy

Education

- Postgraduate programme (2 years including 6 months of research)
- Ph.D. programme (since 2003)
- 3 Masters of Science

Training

The UNESCO Chair has offered short training courses to inform the civil service professionals who work within the government and private sector on the current scientific innovations.

- “Surface and Groundwater Quality Assessment and Modeling”

Training course on water quality modeling under the supervision of the Local Action Research in collaboration with UNDP-Sudan. 30 participants.

- Training course in collaboration with UNESCO-IHE Institute for Water Education, the Netherlands.

Research

- *2nd phase of the FRIEND Nile Project*

Funded by the Flemish Trust Fund (Belgium's Government) through UNESCO, this project aims at improving the management of the River Nile basin water through improved scientific cooperation among the Nile. In its first phase, the project consolidated joint research work between scientists in the Nile basin.

In its second phase, five research areas were established:

- Hydrological Modelling
- Ecohydrology
- Erosion and Sediment Transport Modelling
- Stochastic Modelling Component
- Integrated Water Resources Management Component
- *Nile Basin Capacity-Building Network for River Engineering (NBCBN-RE), Phase II (2006-2010)*

This project was launched in 2000 to create an environment for the exchange of ideas and practices between the professionals of the water sectors on how to efficiently develop the River Nile Basin's water resources. The main themes of the project's phase II are:

- Nile Basin Reservoir Sedimentation Prediction and Mitigation Project
- Nile River Erosion and Protection Project
- *Local Action Project: Assessment of Water Supply Sources and Systems of Potable Water in Khartoum Metropolitan in Relation to Liquid Disposal*

The research objectives are to:

- Evaluate the supply sources of drinking water and its relation with liquid waste disposal system
- Create a geo-spatial database system and inventory water supply infrastructure database
- Exchange experience and disseminate information
- Develop capacity-building and create an awareness program

This research project resulted in the collection and examination of 148 samples from different water resources (surface, ground, waste waters and water supply networks) in Khartoum State and in the realization of maps as well as in a 3D Lithology map for the study area carried out using GIS.

- *Upstream Downstream (USDS) in the Nile Project: Improved water and land management in the Ethiopian highlands and its impact on downstream stakeholders dependent on the Blue Nile* (completed, results disseminated during a workshop in November 2009 in Addis Ababa, Ethiopia).

The project is comprised of the following components:

- Watershed modeling where watershed model is adapted and where interventions were tested
- Water resources simulation modeling where water balance is featured to test the impacts of the interventions
- Policy and institutional aspects

Consultancy Activities

The UNESCO Chair conducted consultancy activities funded by the World Bank through the Nile Basin Initiatives Trust Fund in collaboration with other international organizations.

On a request of the Eastern Nile Technical Regional Office (ENTRO), the UNESCO Chair also collaborated with Riverside Technology inc. (USA) to assess flood risks in the region of the Blue Nile River in Sudan.

The objectives of the project were:

- Flood Risk Mapping for Pilot Areas in Sudan and Ethiopia
- The development and documentation of procedures, tools and models which can be extended and/or applied in other locations
- The provision of training to partners, ENTRO and local government staff to develop the capacity to apply the study, extend its scope and incorporate the concepts into planning and emergency response.

The project has had the following results:

- Field and bathymetric Surveys
- Terrain Modeling of the Blue Nile Basin
- Frequency Analysis of data flow
- Hydraulic Modeling results
- Flood Hazard Mapping
- Vulnerability and Risk Models
- Preliminary Flood Risk Mapping
- Draft Report

Awards and Recognitions

- UNITWIN/UNESCO Chairs programme Distinction Award, UNESCO, Paris, November 2002
- Appreciation Award by Egypt's National Water Research Centre, April 2004, Cairo, during the 2nd Arab Conference.

2. Publications/ Interuniversity exchanges/ Partnerships

Partnerships

Makerere University (Kenya); Gezira University (Sudan); Khartoum University (Sudan); Sudan University for Science & Technology (Sudan); Waghenien University; Other Research and Higher Education Institutions in Africa; Ministry of Irrigation and Water Resources (MIWR), Khartoum (Sudan).