

NEPAD Western African Water Centres of Excellence

A joint stakeholders analysis of the water sector in Western Africa

February 11-15, 2013 - ABUJA, NIGERIA

FINAL REPORT



In the **pictures** from the left: the coordinator of the Network, Prof. Kane, with the ECOWAS Water Commissioner; the participants at the Nigerian Ministry of Water Resources; the participants at the Guarara Dam.

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Executive summary

The workshop held in Abuja, Nigeria from the 11 to 15 of February 2013 in the framework of the EC support project to the AU/NEPAD Networks of Centres of Excellence (Water CoE) in Western and in Southern Africa has been a real success for its contents and results.

Institutional partnerships have been discussed in deep between the Western African Centres of Excellence (CoE) and three regional African institutions: the African Ministers' Council on Water (AMCOW), the Economic Community of West African States (ECOWAS) and the Organisation pour la mise en valeur du fleuve Senegal (OMVS). These organizations identified the CoE as a “**think tank**” able to support and influence positively the reflection on regional and continental policies and strategies, and to answer with their knowledge to the sector’s burning issues.

Fruitful ideas for collaboration have been presented and discussed during the session on research management and joint proposal development. The draft protocols for collaboration will be discussed during the next two months and presented at the next workshop for detailed definition. The procedures to work on the formalization of the protocols were agreed with the representatives of AMCOW, ECOWAS and OMVS and will be undertaken starting end of February 2013.

The stakeholder analysis of the Western African water sector presented at the workshop was carried out by four CoE, namely: The National Water Resource Institute of Nigeria, The University of Benin City (Nigeria), the KNUST University of Kumasi in Ghana and the UCAD University of Dakar in Senegal. The study, which was aimed at identifying the skill gaps, research areas and training needs in the Western African water sector, has been useful to provide recommendations on how the skills shortages in the water sector can be effectively addressed. The most common training needs identified for the region lay in technical fields such as borehole maintenance and rehabilitation, geophysical investigation techniques, drilling technology, remote sensing and GIS, water treatment techniques as well as in cross-cutting issues such as governance and water economics etc.

Improving CoE’s capacities on **research management and impact of research results** on the society has been one of the main activities of this workshop and an entire session was dedicated to this thematic through a training course managed by Dr. Peter Furu of the University of Copenhagen (Denmark). The training course had four objectives: coordinate existing water for development research, establish good research management practice, improve the user of research in policy and practice and establish joint funding activities.

The last part of the meeting was dedicated to **knowledge and geographical data management** for water resources using the AquaKnow platform, followed by a session on analysis of **climate variability impact on water resources availability** organized by the JRC. Practical examples and case studies were presented and discussed as their applications in Latina America and the products for Africa on precipitation variability. The high level of exchanges with the participants showed the great importance

that the experts in the region give to this subject.

The field visit was held at the Gurara Multi-Purpose dam including the irrigation development project and the hydropower installations.

The workshop ended with the meeting of the CoE with the **ECOWAS Water Commissioner** and the **Nigerian Ministry of Water Resources**.

Concerning the **next tasks**, the workshop in Nigeria was the opportunity to detail the actual planning of activities to be undertaken by the Western CoE for the next two workshops planned for the first half of 2013. They will consist in:

- a Western Africa Joint Course will be developed by the CoE and presented at the next meeting as a follow up activity of the stakeholder analysis;
- Related to the “climate variability impact on water resources availability”, at the next workshop participants will bring their own national precipitation data in order to develop joint a regional product.
- a specific session on research management will be held (up to 3 days) at the final workshop in Senegal concerning “identification, formulation and submission joint proposal”.

1. Introduction

This event has been organised in the framework of the European Commission (EC) support project to the African Union/NEPAD Networks of Water Centres of Excellence implemented by the EC Joint Research Centre (JRC).

The following themes were addressed:

- The Western and Southern Africa Water Centres of Excellence - project update
- A joint stakeholders analysis of the water sector in Western Africa
- Knowledge Management for Water Resources data
- Research Management
- Regional data sharing for climate variability impact on water resources Availability

Context

In the past decades the EU has developed a wide cooperation network through Aid, Development Cooperation and Technical and Scientific Cooperation. By adopting in 2002 the Communication on water management in developing countries, a paper setting out EU priorities for development cooperation on water, the EC recognised the crucial role of water resources management for sustainable development. The management of water resources is fundamental to achieve the Millennium Development Goals (MDGs) for which the European Union (EU) has undertaken many commitments to help accelerate progress in reaching these ambitious targets.

In 2009 the EC established a support project to the AU/NEPAD Networks of Centres of Excellence (Water CoE) in Western and in Southern Africa in order to improve the impact of African research and development on the water resources sector. The European Commission is funding, through the Joint Research Centre (JRC), the networks in order to enable Africa to benefit from the diversity of institutions and programmes available across the continent. Fostering this south to south capacity development has for final aim to strengthen the link between policy and research and higher education.

Objectives

This workshop is the first of a series of 3 project workshops that will be held in 2013 in 3 Western African countries members of the Western African Networks of Water Centres of Excellence.

The exchanges and dissemination of good practises in water resources management will embrace the following specific objectives:

- Improving the functioning of the Network of Centres of Excellence
- Development of research management capacities
- Identifying and carrying out the EC project scientific activities
- Presenting the results of the joint stakeholders analysis of the water sector in Western Africa
- Establish the work plan for the next activities

Logistic

The workshop was held in Abuja, Nigeria, from the 11 to 15 of February 2013 at the Bolton White hotel. The JRC supported the participation of the representatives of the African Centres of Excellence and the partner institutions.

The hosts of the workshop were the two Nigerian institutions members of the Network, the National Water Research Institute of Kaduna and the University of Benin in Benin City.

2. Content of the workshop and results

a. Institutional relationships

Three important African institutions were present at the conference: the African Ministers' Council on Water (AMCOW), the Economic Community of West African States (ECOWAS) and the Organisation pour la Mise en Valeur du Fleuve Senegal (OMVS). These regional institutions are equally involved in promoting a sustainable economic development of the region by protecting in sustainable way their natural resources.

More specifically, AMCOW was formed in 2002 in Abuja Nigeria, primarily to promote cooperation, security, social and economic development and poverty eradication among member states through the management of water resources and provision of water supply services. AMCOW has become a specialized committee for water and sanitation in the African Union (AU).

The ECOWAS is a regional group of fifteen West African countries, founded in 1975 whose mission is to promote economic integration across the region. It is also responsible of supporting, coordinating and ensuring the implementation of a shared policy between the different states for the management of water resources in West Africa.

Finally the OMVS is a basin organization whose aim is to implement a program of integrated and concerted management of water resources and ecosystems for a sustainable development of the River Senegal basin.

Their participation and contribution has been very important to the conference for their support and interest that they have shown to the Western African Centres of Excellence (CoE). Each of these institutions proposed possible area of collaboration with the Western African CoE. These can be summarized as follows:

AMCOW proposed that the CoE should be seen as “**think tanks**” and help contribute with their work the AMCOW/AU policies, programs and tools. More precisely, it was suggested that the CoE could work in : tracking progress of the water resources status at different geographical levels (national, basin, local level etc.), contribute with their expertise to the post 2015 debates on water resources management and water, sanitation and hygiene targets, carry on studies and report their results and recommendations to the AMCOW on climate resilience, governance reforms and on the water-food-energy nexus etc. The CoE present an important existing resource that should be used in the region especially in generating professional and carrying on research useful for the water sector. The JRC will support AMCOW and the CoE in formalizing their working links.

The **ECOWAS** insisted that their collaboration with the CoE could be interesting if directed towards the development of a capacity building strategy for Integrated Water Resources Management in Western Africa along with the organization of regional meetings to implement the strategy. Their interest and support was also very oriented towards the subjects of knowledge management and environmental data sharing. As for AMCOW, ECOWAS proposed that the CoE should be seen as “**think tanks**” and contribute with their work on policies, programs and tools. The ECOWAS proposed a roadmap for formalizing the collaboration through a MoU or through labeling the NEPAD CoE as ECOWAS CoE. The JRC will support closely the establishment of this relationship.

The **OMVS** seeks collaboration with the CoE in many areas of research. In details, the CoE could offer their services by:

- assessing the environmental status of the Basin, creating models for the planning, management and monitoring of the water resources, supporting data management, assisting the OMVS in the production of tools for decision support based on Geographic Information System (GIS) and remote sensing applications,
- giving advice on developing sustainable financing mechanisms such as in the subjects of pricing and collection water fees, energy sales etc.

Many fruitful ideas for collaboration have been presented and discussed during the session on research management and joint proposal development (see paragraph c). The draft protocols for collaboration will be discussed during the next two months and presented at the next workshop for detailed negotiations.

b. Summary of stakeholders analysis

The workshop in Nigeria hosted 4 members of the Western African Networks of Water Centres of Excellence: The National Water Resource Institute of Nigeria, The University of Benin City (Nigeria), the KNUST University of Kumasi in Ghana and the UCAD University of Dakar in Senegal. As foreseen in the EC project document, one of the activities for the Western CoE was to carry out a the stakeholders' analysis of the water sector in Western Africa, the results were present at this workshop.

The purpose of the study was to conduct i) a survey on requirements in higher education and training for practitioners in the water sector and ii) a study on how the Centres of Excellence could better address sector expertise consultancy and advocacy needs for sector development in the region.

A variety of methodological approaches have been followed in each different country, they can be summarized as follows: review of existing studies, overview of background documentation, interviews and organization of meetings to set a quick assessment of the situation of human resources in the water sector, development and administration of questionnaires to respondents and finally, the conduct of a survey on water related vacancies.

The findings revealed a deficiency of human capacity and skill gaps that are necessary to be filled to enhance service delivery within the Water Sector in Western Africa. This was attributed to inadequate funding, stagnated recruitment and replacement of retiring officers in the water sector. Skill gaps lie mainly in "software" subject areas such as sector governance, public administration, cultural and social

sciences, forestry, geochemistry, industrial ecology and environmental law whether there is a higher concentration of civil engineers and hydrologist that are however more present in capital cities and big towns at the expense of the countries' inner parts.

The most common training needs that the region requires seem to lay in more technical fields such as borehole maintenance and rehabilitation, geophysical investigation techniques, drilling technology, remote sensing and GIS, water treatment techniques etc. The results on the supply of training have shown that skills development in the water sector is mainly carried through in-service training with few utilizing of further and higher education trainings. This is due perhaps to the fact that institutions working in the water sector do not have the time and the means to let their professionals leave for long (university) courses. In the region, there is a substantial offer of trainings and courses on water resources however in each country a mismatch on what is offered and is really needed has been observed.

This study, which is aimed at identifying the skill gaps, research areas and training needs in the Western African water sector, has also been useful to provide recommendations on how the skills shortages in the water sector can be effectively addressed. Some of these recommendations can be summarized as follows:

- encourage networking between institutions so that skill gaps and training offer can be matched,
- ensure funds for capacity building in water resources management,
- establish a training committee or something similar at national level to coordinate and advise on recruitment and training of human resources in the sector for sustainable development of the workforce,
- help to make the water sector more attractive especially regarding the salaries,
- establish training network centres in various states of the country so that training are aimed at specific needs and duplication do not occur,
- ensure that these kind of studies on stakeholder needs and the actual training offer should be carried out systematically for the sustainability of the water sector.

c. Research management and joint proposal drafting

As foreseen in the project document of the EC support to the NEPAD CoE, the main activities of this workshop has been to improve capacities on research management and impact of research results on

the society.. This session was managed by Dr. Peter Furu of the University of Copenhagen (Denmark). The research management training of trainers lasted 1 ½ day, including a final working group session of around 2 hours on linking research with policy makers.

The training course was based on the material developed in the framework of the SPLASH ERA-Net project (6th EU Framework Program for Research) by the Water, Engineering and Development Centre (WEDC) of Loughborough University and the Department of Veterinary Disease Biology (DVDB) of the University of Copenhagen, and it has four objectives:

- Coordinate existing water for development research
- Establish good research management practice
- Improve the user of research in policy and practice
- Establish joint funding activities

The training course is available at the Internet address: http://www.splash-era.net/res-man_course.php

Given the limited time of 1 ½ available at the workshop, the training for trainers was shortened but the different steps on the research management cycle: *call identification, proposal development, project negotiation, implementation, knowledge management and monitoring and evaluation*, were presented and analyzed and followed by interesting practical exercises. Beyond its general objectives, this training achieved some concrete results for establishing a formal collaboration between the CoE and AMCOW, ECOWAS and OMVS respectively.

In fact, to conclude this session a group work on linking research with policy was carried out. The CoE worked with OMVS and with ECOWAS representatives to define content and modalities of possible collaboration protocols. The results of this session are presented in annex and the results of the discussion are summarized in paragraph 2.a of this report. The procedures to work on the formalization of the protocols were agreed with the two representatives and will be undertaken starting end of February 2013.

d. Knowledge management with Aquaknow and data sharing for climate variability

The last part of the meeting was dedicated to knowledge and geographical data management for water resources using the AquaKnow.net, followed by a short training on regional precipitation frequency analysis based on the L-moments methodology organized by the JRC.

AquaKnow is a collaborative workspace content management system dedicated to technical and scientific knowledge for the sustainable development of the water sector. It also includes a

powerful online GIS module for visualization and analysis of geographical data. The functionalities of this module were extensively described during the presentation and can be summarized as follows: 1) find and download spatial datasets from the AquaKnow Geodata Library, 2) share data among registered members uploading data and maps into the system including the possibility of uploading tables in CSV, shapefile formats, 3) represent them in a map (geocoding tools) exploring data tables, customizing your maps/graphs, and 4) perform spatial operations and visualize maps using the Map tool.

The JRC introduced a short training on analysis of precipitation data using L-moments. The L-moments are statistics that can be used to facilitate the estimation of frequency extreme events. During this session participants had the opportunity to learn about the methodology and discuss some practical examples and case studies in Latina America and Africa. The methodology and the applications are presented extensively in the annexed presentations.

The high level of exchanges with the participants showed the great importance that the experts in the region give to these subjects. Finally, the CoE expressed their interest in using the GIS AquaKnow tool for sharing water resources data as well as their commitment to work towards the development of regional rainfall frequency products.

3. Field visit - THE GURARA MULTI-PURPOSE WATER PROJECT



The field visit of the workshop consisted in visiting the Gurara Multi-Purpose dam including the irrigation development project and the hydropower installations.

The Gurara Multi-Purpose Project was developed by the Federal Government of Nigeria (FGN) primarily to (1) supplement the raw water at Lower Usma Dam for water supply to the Federal Capital Territory (FCT), (2) generate 30MW hydropower, and (3) for the irrigation of 6000 hectares of land, and other ancillary uses like fisheries and tourism development.

It comprises of a large dam, 880 million cubic metres storage capacity, 75 km long conveyance pipeline of 3 m diameter from the dam to Lower Usma Dam for FCT water supply. The dam is built on the upper reaches of Gurara River in Kachia Local Government Area of Kaduna State. Other components of the project are a 30 MW hydropower plant, and the development of 6000 hectares of irrigated land.

The Project was initiated by the Federal Ministry of Water Resources to supply raw water to the Federal Capital Territory (FCT) and to meet the demand for the next 50 years. Until the anticipated ultimate development of FCT, the Gurara Water Transfer Project has been adapted to take advantage of the whole potential brought by the damming of the Gurara River.

Indeed, the relocation of all ministries, government agencies and diplomatic representatives to Abuja, the capital of FCT, has triggered major growth of this city: the population was 1.4 million in 1998 (<http://www.population.gov.ng/files/nationafinal.pdf>) and is expected to reach 5 million by 2035. This requires rapid development of infrastructures and services. Satisfying the increasing water demand has

become a priority issue.

The present urban water demand of Abuja and its satellite towns is 210,000 m³/day, and it is expected to increase to about 1,000,000 m³/day by 2035. At present, all the portable water for FCT comes from a treatment plant downstream of the Lower Usuma reservoir, located 20 km north of the capital city which comprises two units of 5,000 m³/h, phase 1 and 2. Extension to six treatment units, up to 30,000 m³/h, phase 3 and 4, were launched in December 2005, in order to give to Usuma Plant the capacity to treat the additional raw water supplied from Gurara Project.

IRRIGATION PILOT PROJECT

As a consequence of the dam construction, the present seasonal flow in the Gurara valley downstream (droughts during the dry seasons and floods during the rainy season) will be changed into a regular, constant flow all year long. The Federal Ministry of Water Resources approved to develop a modern irrigated agriculture downstream in the Gurara valley to take advantage of this new potential.

The water regulated by valves is conveyed under the reservoir pressure through 1,400 to 800 mm diameter pipes to each irrigated sector.

A 1.5 ha test Irrigation Farm was put in place and the first sowing was performed in December 2006 and harvested in February 2007. Some of the crops being cultivated on the farm include garden eggs, tomatoes, okro, pepper, cucumber, maize, mangos, etc.



THE HYDROPOWER PROJECT

The Hydropower plant is made up of 3 units of turbines and generators of 10 MW each. The plant is ready, while the construction of a 140 km Transmission Line from the 30 MW Hydropower Station at Gurara Dam Site to Kaduna is going on.



4. Next tasks and conclusions

The workshop in Nigeria was the opportunity to revise the actual planning of activities and to define the tasks to be undertaken by the Western CoE for the next two workshops planned for the first half of 2013. The list of tasks with the relevant explanations is presented in next paragraphs as discussed during the workshop in Abuja.

a. The regional joint course

Following the regional stakeholders analysis, the next joint activity to be implemented concerns prioritising the skill gaps defined and as first answer to them, to develop a Western Africa Joint Course. Some of the proposed subjects identified were:

- Transboundary water resources management
- Conflict management/resolution
- Operation and maintenance

These are only suggestions. The CoE will have to choose one overarching topic and then develop sub-topics (one topic per CoE). Each sub-topic should be developed considering a training course of the duration of one week. Therefore, each CoE will have to develop the course material (presentations, exercises, case studies, etc.) for one of the weeks. The KNUST as task's leader will coordinate this task and also will give an overall coherence to the material prepared by each one of the CoE. The final Joint Course will be presented at the workshop in Accra (22 – 26 of April), each one of the CoE will present its sub-topic, with the KNUST presenting the overall Course.

The Course will be made available on-line on Aquaknow and a publication will be produced and presented at the last workshop in Senegal.

The proposed deadlines are:

8/03/2013- Deadline for the choice of the main overarching topic. The choice must then be referred to the leader (KNUST) and the JRC.

15/03/2013 – Deadline for choice of each sub topic, one per CoE. Each member must communicate its choice to KNUST and the JRC.

7/04/2013 – Course material are prepared and sent to the leader. KNUST should put all the material together and give an overall coherence to the entire course.

22/04/2013 – Presentation of the course to the conference.

b. Research management and networking

This session was reckoned as very useful by the CoE, even if more time would have been needed to address the several topics discussed. As follow-up of this activity, it was agreed to hold a specific session (up to 3 days) at the final (third) workshop in Senegal on “joint proposal submission”. The CoE, with the University of Benin as activity coordinator, will agree on the content of this session and refer back at the second workshop.

c. ECOWAS, AMCOW and OMVS

Many fruitful ideas for collaboration have been presented and discussed during the session on research management and joint proposal development (as discussed in the next paragraphs). The CoE worked with OMVS and with ECOWAS representatives to define content and modalities of possible collaboration protocols. The procedures to work on the formalization of the protocols were agreed with the two representatives and will be undertaken starting end of February 2013 (see sessions’ results in annex and paragraph 2.a of this report).

The draft protocols for collaboration will be discussed during the next two months and presented at the next workshop for detailed negotiations.

d. Data sharing for climate variability in West Africa

In the next workshop participants are expected to bring their own national precipitation data for a more complete training exercise. As data sharing and knowledge management on water resources is one of the activities foreseen in the EC support project. The CoE with the support of JRC, are expected to develop a product in line with this purpose. The objective is to develop a joint, sound and scientific product, that require regional collaboration through data collection and sharing, creation of a regional database on precipitation and complex analysis performance, such as the explained climate variability methodology. This final result can be a concrete support based on scientific tools that can help to influence regional policies. The JRC will send out the specifications for the needed data to be brought at

the next workshop. Furthermore, JRC will provide the needed analysis tools and technical assistance for developing the final product.

e. Next workshops

The CoE in Abuja have made the following decisions about the next two workshops. These decisions were confirmed by NEPAD (e-mail 21/02/2013 by Dr. Marcel Nwalozie):

- Workshop n. 2: Accra, 21 to 26 of April 2013 (tentatively)
- Workshop n. 3: Dakar, June 2013

5. List of annexes

1. Agenda
2. List of participants
3. Presentations (online <http://www.aquaknow.net/nepad-western-coe-network>)
4. Results of the working groups (online <http://www.aquaknow.net/nepad-western-coe-network>)
5. Stakeholders analysis reports (online <http://www.aquaknow.net/nepad-western-coe-network>)

All the material included in this report is available at the Aquaknow group of the Western African Centres of Excellence at this address: <http://www.aquaknow.net/nepad-western-coe-network>