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Report of the training workshop on  
**HYDROLOGICAL/WATER ALLOCATION MODELLING IN THE VOLTA BASIN  
WITH MIKE BASIN**

*ORGANISED BY*  
**Sustainable Development of Research Capacity based on the GLOWA  
Volta Project**

**2IE**

**Ouagadougou, Burkina Faso**

**5 – 6 OCTOBER, 2010**

**(RESOURCE PERSON: DR. BARNABAS AMISIGO)**

## **Introduction.**

Within the framework of its activities, Sustainable Development of Research Capacity based on the GLOWA Volta Project (SDRC-GVP) organized a training workshop on the use of the MIKE Basin and ArcGIS software on water allocation in rivers basin such as the Volta from the 5<sup>th</sup> to the 6<sup>th</sup> of October 2010.

The main objective of this workshop was to introduce participants to the use of the MIKE Basin software in setting up and simulating the impact of various water demand and allocation scenarios.

20 participants took part in this workshop organized in Ouagadougou at the 2IE. The opening speech was made by Dr BARRY Boubacar. He thanked and welcomed the participants for their participation. He also announced that SDRC-GVP will come to an end at the end of November.

The workshop consisted of:

The use of ArcGIS and MIKE Basin software in water allocations scenarios including some exercises

The session began with the installation of the ArcGIS and MIKE Basin softwares on the computers.

The first presentation began with the general introduction of two modeling frameworks used in water resources modeling, evaluation, planning and management:

- One is for the simulation and prediction of river catchments water availability through RAINFALL- RUNOFF MODELLING.

- The other is for the direct planning and management of the available observed, simulated or predicted water resources through WATER ALLOCATION ( water demand and supply) MODELLING.

The second presentation began with the introduction of the MIKE Basin software and its functionalities and MIKE Basin application areas namely:

- Water allocation scenarios
- Drought mitigation investigations
- Irrigation demand assessment
- Information management

After the MIKE Basin presentation and its key application areas some exercises were proposed to participants so as to familiarize them with the software.

These exercises included:

- How to digitize rivers and delineate catchments
- How to add and model features such as water users
- How to add and model reservoirs
- How to digitize rivers from maps to schematize catchments

### **How to delineate catchments**

The goal of this exercise was to create both schematic and delineated catchments, add river nodes and catchment runoff. It was emphasized that all inputs be saved before running a simulation.

### **How to add other features**

In this exercise participants were taught how to add features such as water user nodes to the schematized or delineated catchments, input water user abstraction rules and run a simulation. Participants were taught how to analyze the results such as verifying if the water supply from the catchments

meets the demand of the water users and whether water from other catchments in the model setup can be used to satisfy any demand deficits.

### **Modeling a reservoir**

Modeling of a reservoir requires information such as:

- The storage capacity of the reservoir
- The level-area-volume characteristics of the reservoir
- The reservoir operating rules and other characteristics such as reservoir losses and gains, minimum and maximum releases and minimum and maximum operating levels.

Water users supplied from a reservoir can be classified into three main groups according to supply priority (Low, Medium and High Priority groups). Once the water level is decreasing, the Low Priority group will be the first to be restricted.

**Question:** why should the low priority group be the first to be restricted and not the others

**Answer:** It is important to know that these groups and rules are fixed before the reservoir is operated, preferably in consultation with the user groups or stakeholders. Low priority means the first to be curtailed while High priority means the last to be curtailed.

### **How to digitize rivers from existing maps**

The objective of this exercise was to show participants how to extract rivers from existing maps so as to proceed with the creation of catchments from a topographic map and setup and run an appropriate Mike Basin model.

## **Catchment delineation**

This exercise consisted of river reach digitization and delineation of catchments from both a pseudo Digital Elevation Model (DEM) and a real DEM. It included adjustment of DEM elevations and the calculation of flow directions and flow accumulation.

## **The creation of hydro-power nodes**

The modeling of hydro-power node requires the specification of the power demand and the water supply rule curve which determines how water supply to the node would be curtailed in the event of reducing water levels in the supplying reservoir.

## **Questions**

Following questions have been asked to the moderator

**Question:** How can one obtain the MIKE Basin software?

**Answer:** The license is very expensive. However Institutions can buy them for their technicians.

**Question:** How many years does one need to be proficient in MIKE Basin?

**Answer:** The use of MIKE Basin requires a hydrological modeling background and some familiarity with ArcGIS.

The proficiency time would be dependent on the individual.

## **CLOSURE OF WORKSHOP**

In a short speech, Dr. Barry expressed his satisfaction with the results of the workshop. He thanked the trainer for his availability and effort, participants for their contributions and participation and the organizers for a well organized workshop. He reminded participants that the next workshop will take place in November. He also commented on social aspects of workshops saying that,

apart from trainings received, they help participants to establish good relations between themselves. Finally, he urged participants to improve their proficiency in English since most of scientific documents are in English and the best way to use them is to have a good background in English. Dr Barnabas Amisigo, the moderator of this workshop also thanked the participants for their participation and also for their availability during the workshop.

Participants were then given the opportunity to comment on the workshop and its organization.

Most of them said that they were satisfied but wished that they had access to the software to continue the exercises at home since two days were not enough to understand the software well. A few recommendations were also made:

- Increase the duration of the workshop so as to allow participants to understand the software well.
- Provide participants with the software and the key to continue practicing at home.

## **APPENDIX**

### **APPENDIX1: PROGRAMM OF THE WORKSHOP**

#### **From October, 6<sup>th</sup>**

9o'clock: Beginning of the session

10:30: Coffee break

13o'clock: Lunch breach

15 o'clock: Coffee break

18 o'clock: End of the session

#### **Thursday 7<sup>th</sup> october**

9 o'clock:

10:30 Coffee break

13 o'clock: Lunch

15 o'clock: Coffee break

18 o'clock: End of the session

**APPENDIX2**

**ATTENDANCE SHEET**

<b>N°</b>	<b>Names and Surnames</b>	<b>Institutions / Functions</b>	<b>Full Addresses (BP + tel + fax)</b>
1.	SANFO Safietou		Tel : 79 26 48 50
2.	SANOU Boureima	Centre SIGET -A	Tel : 76 41 39 21
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4.	BOATENG-GYIMAH Maxwell	UICN /PAGEV	Tel : 76 40 36 80
5.	TCHENDO Kola	UICN/PAGEV	Tel : 72 83 70 35
6.	IBRAHIM Boubacar	2IE	Tel : 71 40 96 24
7.	SANDWIDI Jean Pierre	VNU SP/CONNEDD	Tel 70 32 97 89
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18.	ZONGO Issa	ABV/WASCAL	Tel : 76 07 58 03
19.	SIDIBE Aminata	ABV/WASCAL	Tel : 78 05 27 05
20.	DEMBELE Youssouf		