



IMPETUS Benin

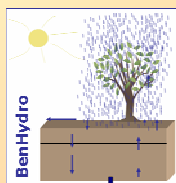
Decision support for balancing water availability and water demand

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The SDSS BenHydro

The SDSS BenHydro was developed to support the water management of the Ouémé catchment. It enables the user to analyse the impact of environmental changes (land use, climate) and changes of socio-economic conditions on available water resources and on water demand. It is designed for decision makers in water management in Benin with low experience in hydrological modelling.



The highlights of the system are:

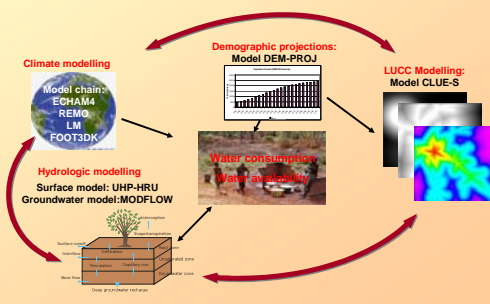
- Interdisciplinary modelling approach combining climate, land use and hydrologic modelling with water demand
- Simple to use Graphical User Interface (GUI)
- Definition of predefined and user-defined scenarios possible
- Exportable results

Modelling of water availability

To assess the water availability for different scenarios an interdisciplinary modelling approach is applied. This approach combines the results of the climate model REMO (after downscaling), the LandUseCoverChange model CLUE-S with the hydrological model UHP-HRU.

This model calculates the surface water availability and the groundwater recharge.

To assess the groundwater dynamics of the groundwater model MODFLOW will be included into the system.



Database

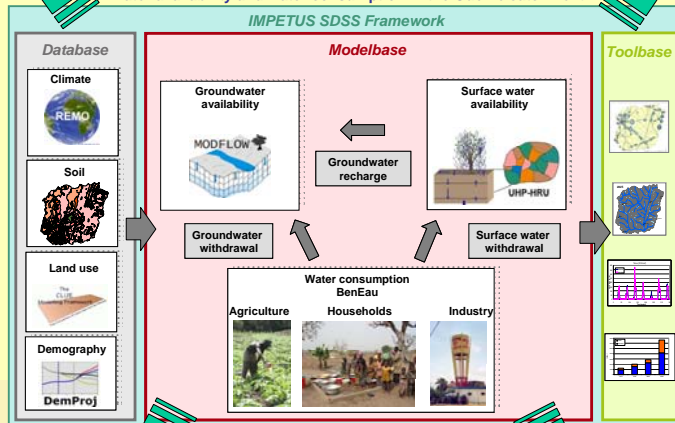
The database of BenHydro contains datasets with results from different models or other SDSS:

- Climate scenarios (REMO)
- Land use scenarios (LUMIS)
- Demographic scenarios (DemProj)
- Water demand scenarios (BenEau)
- Livestock (BenIMPACT)

The user can combine the climate, landuse and water demand scenarios via a Graphical User Interface. In addition scenarios can be defined for the water demand manually by the user.

SDSS BenHydro

Water availability and water consumption in the Ouémé catchment



Toolbase

The IMPETUS framework contains several tool for analysing the obtained results of each SDSS. In BenHydro the following tools are implemented:

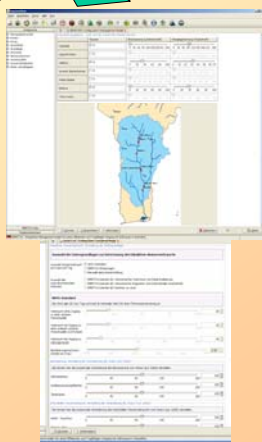
- Results can be displayed as maps, charts and tables for different catchments
- All result presentations are exportable
- Different scenarios are stored in the results database and can be compared with each other
- Water availability and water demand can be compared to assess the potential hotspots of water scarcity.

The Graphical User Interface

The user is guided through the system with a Graphical User Interface which is imbedded in the IMPETUS SDSS framework.

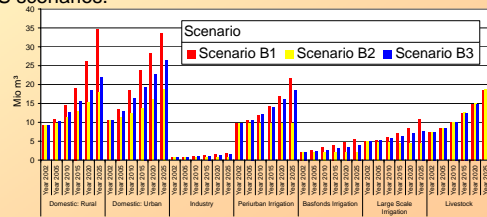
In addition to predefined IMPETUS scenarios the user can create his own scenarios. For example different reservoirs with different water withdrawals can be defined.

In the water demand dialog frame the user can define the development of the household, agricultural and industrial water demand according to his own ideas.



Implementation of the water demand SDSS BenEau

The water demand for Benin is calculated in an other SDSS called BenEau. The user switches to the interface of BenEau by choosing the water demand option in BenHydro. In BenEau the three IMPETUS-scenarios for water demand are available. In addition the user can define his own scenarios. The system includes household, industrial and agricultural water demand for different scenarios. The figure shows the water demand of different user groups in the Ouémé-Bonou catchment for the three IMPETUS scenarios.



Conclusions

- The assessment of the future development of water availability and water demand with plausible scenarios is important for the water management.
- With an user friendly SDSS the water authorities in Benin can easily visualise the different scenarios and create their own scenarios with other options.
- The open-source technology allows a free distribution of the tools in the target countries.
- To insure a sustainable implementation of the tools in Benin, the SDSS are discussed with the relevant stakeholders in order to improve the systems. Furthermore stakeholder trainings are carried out.



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