CLIMATE CHANGE MITIGATION AND ADAPTATION

EVALUATION AND ALLOCATION OF WATER RESOURCES: APPLICATION OF THE WEAP21 MODEL TO THE UPPER COMOÉ RIVER BASIN

BACKGROUND

The Upper Comoé, which straddles the Comoé, Kénédougou and Houet provinces, comes under enormous pressure in terms of its water resources, including (i) the water supply to the towns of Banfora and Bérégadougou, (ii) the operations of the largest sugar producing company in Burkina Faso (SN-SOSUCO), and (iii) rice growing and market gardening, which are part of the fight against food insecurity. Our project consisted of evaluating the impact of climate change and human pressure on the availability of water resources in the Upper Comoé river basin.

DESCRIPTION

Analyses were carried out using the Water Evaluation and Planning (WEAP) model, and based on hydro-climatic data, soil use data and water use data in the Haute-Comoé river basin. Hydro-climatic data for the period 1981–2015 and agricultural site data (6,760 hectares) were considered. The climate data used to develop the scenarios was taken from the KNMI Climate Explorer (2017) website. Several scenarios were modelled to assess their impacts on water needs satisfaction levels in the basin by 2100.

The following results were obtained (see the figure below):

- Assuming an average temperature increase of 2°C by 2100 (RCP2.6) would increase water deficits by 59.22% in the Upper Comoé basin.

- Assuming a temperature increase of 4.8°C by 2100 (RCP8.5) would increase water deficits by 88.09% compared to the current situation.

Figure 1: Comparison between the effects of variable climate and constant climate on unsatisfied demand.

IMPACT

The report has been shared with various actors. In 2018, the Cascades Water Agency delineated an easement strip around the Moussodougou Dam, within which activities that have an impact on water resources are prohibited. WEAP model training was also carried out for Burkina Faso's water agencies in October 2018, to help them make use of the tool and organise water allocation between users.

LESSONS LEARNED

- To implement such a project, there is a need for:
- basic knowledge about river flow hydrology and how to use the WEAP model,
- good quality data on river flows, acquifers, the climate and water use, and
- knowledge about adaptation and mitigation in relation to climate change.

Country: Burkina Faso

Sector: Water

Key words: Water resource allocation, climate change, WEAP model

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