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The Volta Basin Water Allocation System: assessing the impact of small-scale reservoir development on the water resources of the Volta basin, West Africa

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Abstract. In the Volta Basin, infrastructure watershed development with respect to the impact of climate conditions is hotly debated due to the lack of adequate tools to model the consequences of such development. There is an ongoing debate on the impact of further development of small and medium scale reservoirs on the water level of Lake Volta, which is essential for hydropower generation at the Akosombo power plant. The GLOWA Volta Project (GVP) has developed a Volta Basin Water Allocation System (VB-WAS), a decision support tool that allows assessing the impact of infrastructure development in the basin on the availability of current and future water resources, given the current or future climate conditions. The simulated historic and future discharge time series of the joint climate-hydrological modeling approach (MM5/WaSiM-ETH) serve as input data for a river basin management model (MIKE BASIN). MIKE BASIN uses a network approach, and allows fast simulations of water allocation and of the consequences of different development scenarios on the available water resources. The impact of the expansion of small and medium scale reservoirs on the stored volume of Lake Volta has been quantified and assessed in comparison with the impact of climate variability on the water resources of the basin.

Full Article in PDF (PDF, 665 KB)

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