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Energy and Reservoir Management for optimized Use of Water Resources. A case study within the Water-Food-Energy context of Nexus in the Nile River basin.

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The Nile, the longest river in the world, is a source of fresh water for millions of people. Eleven African countries share its basin and compete for its resources. However, the continuously growing water demand in combination with the population growth have led to enormous water scarcity in the Nile River basin. The potential impacts of climate change has increased the concern about the water crisis in the basin.

Sufficient and integrated water resource management is required to provide water security in the Nile basin. The NIMA-NEX project (NIle MAnagement Nexus EXpert tool) aims at optimizing the use of water resources along the Nile River in terms of a nexus approach (nexus: derived from Latin, “the act of binding together”). The optimization will be achieved by means of a proper reservoir, energy, and irrigation management.

The MA-NEX module is the subject of the present study. This module, comprising a part of the NIMA-NEX project, will concentrate on the reservoir and energy management as well as on the water allocation among the competing users. Consequently, it will result in the optimization of the water resource use within the Nile basin. The objective is to optimize the water use in the basin, so as to maximize the ecological, economic and social benefits. Social factors strongly influence water resource use within the Nile River basin. Therefore, the MA-NEX module will optimize the water resource use centered on these social factors.