The Eight International Conference for Development and Evvironment in the Arab world

Abstracts

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OPTIMIZING WATER RESOURCES IN EGYPT: THE CASE FOR SEDIMENT DEDUCTION AT THE HIGH ASWAN DAM RESERVOIR

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ABSTRACT:

Scientists in Egypt are particularly interested in the sustainable management of water and land resources. Global warming and the higher temperatures will lead to higher evaporation rates, which, in turn, will result in less water available at the High Aswan Dam Reservoir (HADR). Egypt's Ministry of Water Resources and Irrigation predicts that the evaporation losses will, compared to the mean annual evaporation rates for the last 30 years, be approximately 3% to 10% higher by the year 2100. Since the construction of the High Aswan Dam fifty years ago, high sediment loads have been a tremendous problem. 6.6 Billion Cubic Meter (BCM) of sediments were deposited in the HADR during this period. These sediments have raised lakebed levels as well as led to higher water levels and a larger surface area, and these developments, in turn, have decreased the storage capacity of the HADR and increased the evaporation rate. This paper investigated the impact of lowering the lakebed by removing sediments from the HADR with a distinct emphasis on evaporation losses. An up-to-date digital elevation model for the HADR, developed by Elba, was used to describe the hydrological characteristics of the HADR, and it was modified to assess the consequences of removing sediment deposits. The study showed that removing these deposits from the HADR will reduce evaporation losses by about 1.1 BCM by 2100, which represents 6.5% of the total projected evaporation losses.