APPLICATION OF THE WEAP MODEL IN INTEGRATED WATER RESOURCES MANAGEMENT OF THE NYANDO RIVER BASIN, KENYA

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ABSTRACT

The Nyando River Basin experiences highly variable weather patterns which pose a challenge to water resources availability and distribution. There is need to store flood water for use during drought especially for irrigation. The potential of the three dams proposed by JICA to meet the irrigation water requirements for rice irrigation in the Kano Plains needs to be investigated. There is need to develop long term and sustainable water resources management strategies for the basin. This study was therefore undertaken to evaluate the current and future water supply, demand status, water allocation and the ecological water requirements in the basin in a sustainable way.

Rural, urban, livestock, industrial and Irrigation water demands were calculated and the in-stream flow water requirement set. Irrigation water demand for the basin was simulated at current, half and full irrigation potential. Scenarios were then developed to evaluate the unmet irrigation water demand.

Results of the study revealed that the basin presently has high unmet water demand. The total Current Unmet Water Demand was estimated at 15.33 MCM. The Unmet ecological flow requirement with two dams in place was highest in January at 5.0 MCM during extreme low flows. With the expansion of basin irrigation area to its full potential, the total unmet irrigation water demand would be 482 MCM. Scenario studies revealed that with establishment of the three proposed dams, it is possible to satisfy the full irrigation potential development in Ahero and S.W. Kano from the current 1600 ha to 25000 ha.