NR> Vol.2 No.3, September 2011

OPEN ACCESS

The integration of FAO-CropWat Model and GIS Techniques for Estimating Irrigation Water Requirement and Its Application in the Gaza Strip

PDF (Size:692KB) PP. 146-154 DOI: 10.4236/nr.2011.23020

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ABSTRACT
In the Gaza Strip irrigation practices are only based on the farmer ' s own experience, they determine when and how to irrigate crops based on the appearance of the soil and the climatic conditions. Even though FAO-CropWat model is used for many countries to estimate irrigation water requirements, it is rarely used for Gaza Strip. In the current re-search, it is the first attempt to model the historical available meteorological data to estimate the irrigation water requirements for the most common cultivated crops (citrus, almonds, date palms, grapes) and to compare the results with the farmer irrigation practices. The model results show that, the reference evapotranspiration accounts for 1451 ± 5 mm/year. Therefore the irrigation water requirements estimated to be 763, 722, 1083, 591 mm/year in average for Citrus, Almonds, Date palm, Grapes, respectively. The farmer irrigation practice exceeding the irrigation water requirement by 30%. The spatial distribution of irrigation water requirements in the entire area of Gaza Strip is shown on maps derived by GIS technique based on data from eight meteorological stations. Irrigation water quality is not optimal in the Gaza Strip, chemical analysis of irrigation wells indicate high salinity and SAR ratio. The obtained results from the model could be a good management tool for the planners and decision makers to minimize the overexploitation of the groundwater and to build fair and strict regulations to optimize the water use in agricultural sector in the Gaza Strip which characterized by semi-arid region.

KEYWORDS
Cropwat Model, FAO, Irrigation Demand, Gaza Strip, Evapo-Transpiration

Cite this paper
H. Al-Najar, "The integration of FAO-CropWat Model and GIS Techniques for Estimating Irrigation Water Requirement and Its Application in the Gaza Strip," *Natural Resources*, Vol. 2 No. 3, 2011, pp. 146-154. doi: 10.4236/nr.2011.23020.

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