

Using remote sensing and GIS for assessment of irrigation performance in the Al-Hindiyah Barrage, Babil City, Iraq

ABSTRACT

Problems and concerns over water lack would affect irrigated agriculture. Iraq suffers from shortage water and the principle use of water is for irrigation. Hence, better performance of irrigation saves more water, which can be used for other purposes. The objective of the research is to assess the irrigation performance in Al-Hindiyah barrage located in Babil city, in middle of Iraq using GIS and remote sensing. In order to achieve this objective, performance of the irrigation season for 2014 was defined upon five indicators, namely relative water supply, general consumed ratio, relative evapotranspiration, depleted fraction and crop water deficit. Actual and potential parameters of evapotranspiration used in determination of these indicators were estimated depending on the method of Surface Energy Balance Algorithm for Land (SEBAL) by using a series of Landsat OLI satellite images. The range of seasonal averages of these indicators was between (0.138 and 2.704) for overall consumed proportion (0.395-7.129) for relative water supply (0.061-1.136) for depleted fraction (0.407-0.464) for relative evapotranspiration and (200.757-247.474) mm/month for crop water deficit. The result of this study indicated that the performance of the irrigation was poor according to the average of seasonal values of all performance indicators. The performance indicators revealed that the supplied irrigation water was less than needed. Thus, it was determined that nearness to the source might be an advantage to obtain water, and there should be a concurrence between the period when water is provided and the period when it is needed.

Keyword: Irrigation performance; Actual evapotranspiration; SEBAL; Remote sensing; GIS