

ONLINE IRRIGATION PERFORMANCE ASSESSMENT TOOL A CASE STUDY IN HAKRA 4R IRRIGATION CANAL PAKISTAN

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Presently the demand for GIS and RS applications has been dramatically increased due to the fact of its capability of producing accurate and reliable outputs for decision making. These outputs are mainly generated through expert knowledge of GIS professionals and use of high end computers. When it comes to the use of GIS and RS for any application considerably a huge cost has to be allocated on GIS and RS and have to concern the selection of GIS professionals.

Nowadays the trend is to use internet based automated GIS applications (or Web based GIS applications) to overcome most of the above mentioned issues related with GIS and RS applications. A web based GIS application is hosted in a powerful server with its associated GIS components and the GIS operations are catered as per the end user requirements. The GIS components are preprogramed to process data within the server and return the output to the user over the Internet (using a web browser).

The main objective of this project is to setup a web processing environment using robust open source GIS software packages and implement web based solution for irrigation performance assessment. Though the calculation of evapotranspiration using Remote Sensing maps is a complicated work, this tool is capable of doing that work online with the use of several open source GIS and RS packages. Generation of evapotranspiration and evaporative fraction maps and returning its associated statistical outputs is the functionality of the tool in a nutshell. MODIS products are taken as the key inputs to the system. The system uses web processing services, GRASS modules, GDAL and numpy python packages at the server end to produce the remote sensing outputs at the server end.

This tool provide performance indicators Adequacy, Equity and reliability in the form of statistical figures and graphs. Ultimate goal of system is to calculate indicator values by generating ET and EF raster maps for specified area. This tool has developed to be able to use for any region.

Adequacy refers to the adequate water supply for an irrigated land and the system does produce the indicator figure by use of EF map. Equity refers to equal water supply for the irrigated land and the system generate the indicator by coefficient variant of ET actual map. Reliability is the temporal behavior of Adequacy and it is provided in a graph output by the system. Tool outputs were generated at Hakra Branch Canal Pakistan to present the indicator outputs and results are discussed with three different selections of Hakra Branch Canal Pakistan.