

## Performance Evaluation of Irrigation Project Using RS & GIS - A Case Study of Upper Ganga Canal Command

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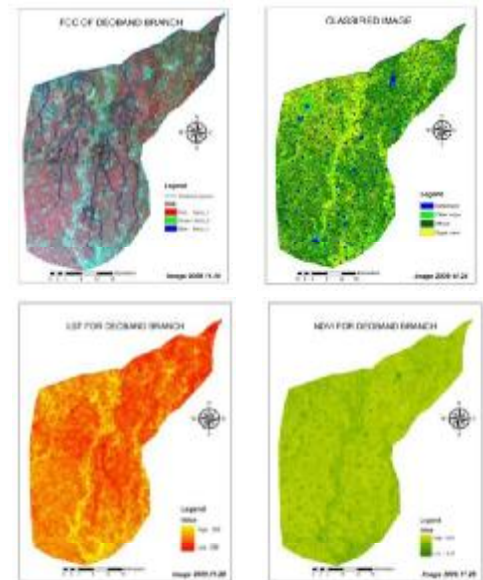
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Irrigated agriculture is under tremendous pressure to escalate the production to feed rising population. To sustain balance between the supply and demand of agricultural produce more area must be brought under irrigation and the performance of existing irrigation projects must be assessed. The traditional performance evaluation techniques are mainly based on the field observed data and hence can be done at higher hierarchical levels. With the advent of remote sensing and GIS techniques the possibility of accurate, spatially & temporally distributed evaluation of irrigation project has increased exponentially. In present study an attempt has been made to formulate a methodology to evaluate the performance of canal irrigation system using Remote sensing and GIS.

Part of command area of Upper Ganag Canal Project has been selected as study area. Temporal remote sensing images (Landsat 5- TM) along with other field data were collected to estimate the indicators to evaluate the performance of the irrigation system. The project is evaluated for adequacy, equity, reliability, efficiency, productivity, and environmental performance. Spatially distributed irrigation water requirement estimated using RS data was the main input in estimating majority of performance indicators. Equity of supply is evaluated using RS derived temporal land surface temperature (LST) and vegetation index (NDVI) maps.

The results shown in following table indicates that the Deoband Canal System (part of Upper Ganga Project) performance well in terms of adequacy, efficiency, productivity, reliability the RS based waterlogging mapping indicates the better environmental performance of irrigation system. The LST and NDVI analysis also indicates the equity of irrigation water supply. Deoband Canal System performances well in all the aspects of 'Essentials of Good Irrigation System'



IRRIGATION DISCHARGE (m <sup>3</sup> )	TOTAL ETa all crops (m <sup>3</sup> )	Irrigation Intensity	RWS	RIS	DF	Irrigation Efficiency	Crop Yield per mm ETa (tonns/m)	Crop Yield per meter of Water Supply
70030240.62	47799552	34.42	1.53	1.62	0.64	0.68	18.16	12.39

Results of present study indicates that application of RS & GIS in performance evaluation process has not only increased the accuracy of the process but also the level at which performance evaluation can be done (distributary or minor level).

**Keywords:** Irrigation water requirement, RS&GIS application, Equity, Performance evaluation