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## Climate Change Induced Land Degradation and Socio-Economic Deterioration: A Remote Sensing and GIS Based Case Study from Rajasthan, India

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### ABSTRACT

The present study attempts to identify and quantify climate change induced land degradation at watershed and village level in Jaggar Watershed of Eastern Rajasthan using remote sensing and GIS technique. The study utilizes Standard Geocoded FCC LISS II data of 1989, and LISS III data of 1998 and 2009 on 1:50,000 scale for Land use/land cover mapping. Maps were digitized, edited and analyzed in GIS to ascertain land use/land cover changes. Comparative analysis of the Land use/land cover statistics and village level household survey reveals that climate change has severely affected land use/land cover especially agriculture land. Agricultural land in the watershed has decreased from 12,026 ha (34%) to 10,400 ha (29.65%) from 1998 to 2009. The area occupied by surface water resources of the major water body has decreased by 207 ha owing to decline in rainfall over the years. Climate data analysis suggests that average maximum and minimum temperatures during the period 1977-2007 have increased by 1.2°C and 0.4°C respectively. Increasing trends of temperature suggests warming up of the area. Decline of ground water table by 1 - 2 m on annual basis coupled with significant drawdown has led to water scarcity in many parts of the watershed. The water table has gone down to a depth of 240 feet, which was reported at 60 - 70 feet 20 years back. The area has shown sharp decline of rainfall by 269 mm from 1977 to 2007. The survey results show that there has been shift in the cropping pattern during the last 20 years due to change in climate as well as decline in availability of water for irrigation. Climate change seems to have played a key role in Jaggar watershed resulting in land degradation and making rainfed agriculture more vulnerable.

### KEYWORDS

Climate Change; Remote Sensing; Land Use/Land Cover; Socio-Economic

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