

Effects of Urbanization on Land Use/Land Cover and Stream Flow of a Sub-Tropical River Basin of India

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Abstract : Rapid urbanization changes the land use/land cover pattern of a developing region. Due to these land surface changes, stream flow of the rivers also changes. It is important to investigate the factors affecting hydrological characteristics of the river basin for better river basin management planning. This study is aimed to understand the effect of Land Use/Land Cover (LU/LC) changes on stream flow of Upper Bhima River basin which is highly stressed in terms of water resources. In this study, Upper Bhima River basin is divided into two adjacent sub-watersheds: Mula-Mutha (urbanized) sub-watershed and Bhima (non-urbanized) sub-watershed. First of all, LU/LC changes were estimated over 1980, 2002, and 2009 for both Mula-Mutha and Bhima sub-watersheds. Further, stream flow simulations were done using Soil and Water Assessment Tool (SWAT) for the streams draining both watersheds. Results revealed that stream flow was relatively higher for urbanized sub-watershed. Through Sensitivity Analysis it was observed that out of all the parameters used, base flow was the most sensitive parameter towards LU/LC changes.

Keywords : land use/land cover, remote sensing, stream flow, urbanization