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Variations in natural water availability due to increasing built-up area induction in urbanization: A case of Bhopal, India

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Urbanization is physical transformation of landscapes where natural land covers are replaced by Developed one, mostly impervious layers. Most of the changes in natural system due to urban development are irreversible and gives a very strong reflection of impact of anthropogenic activities on it. Since open spaces are replaced steadily there are dramatic changes observed in the water flows and water infiltration parameters of hydrological cycle. Natural drainages have been replaced by human structures, or reengineered for human purposes. Urban factors like increase in built-up areas that add to the impervious layers and also the behavioral changes of hydrogeology on the induction of these surfaces on different types of soils give different responses for surface flows and resulting water recharge. The paper is an attempt to analytically workout changes in natural drainage and its relation with urbanization considering the soil characteristics of different catchments. This was analyzed using Arc GIS for Built up calculations and recharge with SWMM model as well as water level observations for past 20 years. The results obtained were correlated to the geological characteristics so as to obtain a relation between natural drainage system and urbanization. Depending upon the observations and correlations, conclusion was made for suitable percentage of Built up/ impervious layers induction on the type of soil so that natural system of drainages can work along with development. Also land use activities were suggested as per different soil types.

Biography

Sheetal Sharma is a full time Research Scholar (PhD) in Department of Architectural and Planning, with Graduation in Bachelor of Architecture (Gold Medalist) in 1997 and Masters in Urban Planning in 2010 as University Topper from Maulana Azad National Institute of Technology, Bhopal, India. She is a reputed Architect having 17 years of Experience in field as well as an excellent academician having brilliant performance always and very hardworking towards the research activities and analysis. Having published around 12 papers worldwide she is progressing intensely towards her Doctorate degree with environmental planning subject in area of surface water flows in urban areas in context of physical planning.

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