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CONSERVING WATER AND SOIL MOISTURE IN CITIES USING WATER SENSITIVE URBAN PLANNING

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Urbanization has crossed the limits of natural carrying capacity challenging mankind and its development in terms of progress. The most notable changes in the natural system observed are related to the urban and hydrological system where built up areas in urban region has increased from 100,000 km2 in 1994 to 5,000,000 km2 in 2005. It is assumed that almost 0.5 % of the world surface is occupied by urban areas. 7.3 billion People live and work on 7.6% of global land. In last 40 years population increased by 1.8% whereas built up has increased by more than 2.5% associated with urban areas have also had noticeable change of 145.68% as compared to 54.05 % change in population growth from 1971 to 1999. Considering land cover as main component of physical planning and runoff as prime effect of urbanization to the hydrological cycle in terms of behavior of surface water and soil moisture thus results in emission of carbon dioxide and green house gases. The aim of the study is to fill the gap of correlation between increasing built up areas and resulting surface runoff, to develop a better understanding of the interactions between surface water flows and water replenishment with changes in land cover characteristics resulting from urbanization at the local, neighborhood and regional scales. The objective is to find out relationship between built up and water (surface and sub surface) with empirical, observational and simulation processes for an area with specific climate and physical characteristics. The methodology adopted to study and observe this correlation broadly consist of observation for variations in spatial scale for sub watersheds around 500 or more hectares for urban expansion, changes in land use land cover and hydrological components such as water level in aquifers, wells, runoff and drainages from past to present at temporal scale of about 40 years . Conclusion were made on final modeling results with validation and assessment of parameters concluding that runoff is directly proportional to built up and its intensity varies with given roughness and land cover. Four combination of land cover, geological characteristics for sand stone, alluvial and basalt, type of vegetation and roughness are observed for given study area forming four equations having induced built up, roughness, land cover, resulting runoff equation on different soil types, obtaining required runoff on proposed built up in physical planning. Conclusions also consist of inferences of resulting runoff as per local planning bye laws with more additional comments for the required changes in the existing bye laws for water sensitive physical planning concept. Also certain concepts like catch water where it falls can be incorporated with these equations to facilitate ground water infiltration and storage.

Biography

Sheetal Sharma has completed her PhD in Architecture & Planning, MANIT Bhopal, India (December 2010-December 2015), M Plan in Urban Development Planning (Gold Medal), MANIT Bhopal, India (July 2008-August 2010), B Arch (Hons) in Architecture (Gold Medal), Amrawati University, India (June 1992- June1997). Currently she is pursuing M Val, Indian Institute of Valuers, New Delhi, India (February 2017 – presently). She has been as a Research and Teaching Assistant, MANIT Bhopal, India (December 2010 – June 2014). Her research is on urban water conservation in the context of master plan and land use guidelines, nalysis for smart city interventions and effects of urbanization on natural resources and sustainable planning. Currently, she is an Assistant Professor, Dept. of Architecture & Urban Planning, MANIT Bhopal, (January 2015 – presently), full time academic teaching of 20-22 lectures in week, with courses in Planning, Architecture. She has more than 15 national and 20 international publications. She has been as a Session chair in many international conferences and she has been awarded international Best paper award.

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