

Hydrological Parameters for Urban Construction

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Through the evolution of human settlements cities have been built on the riverbanks, in the coastal regions and even on marshy land. There have been many a cases of buildings having to face flooding, soil erosion and even subsidence in part or whole. In cities, where buildings were / are allowed water supply from deep tube wells, regulations are being changed because of receding aquifer levels. Also due to increase in foundation costs they are becoming expensive. Hydrological factors are important consideration for construction activities in an urban conglomeration.

Urbanization profoundly affects urban hydrology and can lead to a spiraling socio economic and ecological degradation. By virtue of its very nature urban construction results in shrinkage of permeable surface area. On the other hand indiscriminate depletion of ground water has resulted in lowering of water tables. Sustainability of urban water supply is, therefore, one of the core issues being faced by urban planners and architects. The situation is expected to aggravate further in the near future with rapid urbanization being witnessed. The ground water resources in most urban areas are already under severe stress. The paper will explore various means of conserving and protecting the subsoil profile to alleviate this stress through installation of high efficiency plumbing fixtures, efficient use/reuse of waste water, adopting water saving practices through innovative legislation etc. to name a few.

In tandem with conservatory exercise harvesting of rainwater and its use for recharging ground water is an important remedial measure. It contributes to effective resource management of urban hydrology. In coastal urban areas these measures are effective in pushing back sea-water and fresh water interface. The importance of roof top rainwater harvesting in lieu of reduced natural recharge surface within the urban areas becomes highlighted. The paper will further explore various recharging methodologies such as porous concrete, soft concrete in pavements, parking lots etc. alongside percolation pits, open wells etc. Based on Hydrogeological and hydrological parameters of specific urban areas appropriate methodology to be adopted through redefined Building construction regulations such as mandatory construction of storage tanks, controlled rainwater discharge, etc. In cases where there are scattered small buildings, a community harvesting systems to be proposed. The paper in conclusion will enumerate the need, necessity and compulsion to adopt rainwater harvesting and intervention to augment the ground water resources and its efficient management. The hydro-ecology balance and its continued maintenance become important for sustaining urban development.