

Rainwater Management in Smart City: Focus in Gomti Nagar Region, Lucknow, Uttar Pradesh, India

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Abstract : Human civilization cannot exist and thrive in the absence of adequate water. As a result, even in smart cities, water plays an important role in human existence. The key causes of this catastrophic water scarcity crisis are lifestyle changes, over-exploitation of groundwater, water over usage, rapid urbanization, and uncontrolled population growth. Furthermore, salty water seeps into deeper aquifers, causing land subsidence. The purpose of this study on artificial groundwater recharge is to address the water shortage in Gomti Nagar, Lucknow. Submersibles are the most common methods of collecting freshwater from groundwater in Gomti Nagar neighbourhood of Lucknow. Gomti Nagar area has a groundwater depletion rate of 1968 m³/day/km² and is categorized as Zone-A (very high levels) based on the existing groundwater abstraction pattern - A to D. Harvesting rainwater using roof top rainwater harvesting systems (RTRWHs) is an effective method for reducing aquifer depletion in a sustainable water management system. Rainwater collecting using roof top rainwater harvesting systems (RTRWHs) is an effective method for reducing aquifer depletion in a sustainable water conservation system. Due to a water imbalance of 24519 ML/yr, the Gomti Nagar region is facing severe groundwater depletion. According to the Lucknow Development Authority (LDA), the impact of installed RTRWHs (plot area 300 sq. m.) is 0.04 percent of rainfall collected through RTRWHs in Gomti Nagar region of Lucknow. When RTRWHs are deployed in all buildings, their influence will be greater. Bye-laws in India have mandated the installation of RTRWHs on plots greater than 300 sq.m. A better India without any water problem is a pipe dream that may be realized by installing residential and commercial rooftop rainwater collecting systems in every structure. According to the current study, RTRWHs should be used as an alternate source of water to bridge the gap between groundwater recharge and extraction in smart city viz. Gomti Nagar, Lucknow, India.

Keywords : groundwater recharge, RTRWHs, harvested rainwater, rainfall, water extraction

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