

## Quantifying the Rapid Urbanization Impact on Potential Stormwater Runoff of Dhaka City, Bangladesh

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**Abstract :** Historically, rapid urban growth activities are considered one of the main culprits behind urban floods or waterlogging. The increased unplanned urbanization of many areas of Dhaka has resulted in waterlogging, urban floods, and increasing groundwater depth. To determine potential groundwater recharge from precipitation, the study is being conducted to examine the changes in land use/land cover (LULC) and urban runoff extent based on the NRCS-CN from 2005-2021. Four kinds of land use are used to examine the LULC change: built-up, bare land, vegetation, and water body. These categories are used for the years 2005, 2010, 2015, and 2021. The built-up area is growing at a relatively fast rate: 7.43%, 17.4%, and 5.21%, respectively, between the years 2005 and 2010, 2010 and 2015, and 2015 and 2021. As the amount of impervious surface rose in Dhaka city, stormwater discharge increased from 2005 to 2021. In 2005, 2010, 2015, and 2021, heavy stormwater runoff regions made up around 24.873%, 32.616%, 49.118%, and 55.986% of the entire Dhaka city. Stormwater runoff accounted for around 53.738%, 55.092%, 63.472%, and 67.061% of the total rainfall in 2005, 2010, 2015, and 2021, respectively. Between 2005 and 2021, a significant portion of the natural land cover was altered because of the expanding impervious surface, which also harmed the natural drainage system. Due to careless growth, the potential for stormwater runoff and groundwater recharge in Dhaka city worsens every year. Concerning this situation, a sustainable urban drainage system (SUDS) can be the best possible solution for minimizing the stormwater runoff and groundwater recharge problem.

**Keywords :** LULC, impervious surface, stormwater runoff, groundwater recharge, SUDS

**Conference Title :** ICURPT 2023 : International Conference on Urban, Regional Planning and Transportation

**Conference Location :** New York, United States

**Conference Dates :** August 10-11, 2023