

Scope of Rainwater Harvesting in Residential Plots of Dhaka City

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Abstract : Urban flood and drought has been a major problem of Dhaka city, particularly in recent years. Continuous increase of the city built up area, and limiting rainwater infiltration zone, are thought to be the main causes of the problem. Proper rainwater management, even at the individual plot level, might bring significant improvement in this regard. As residential use pattern occupies a significant portion of the city surface, the scope of rainwater harvesting (RWH) in residential buildings can be investigated. This paper reports on a research which explored the scope of rainwater harvesting in residential plots, with multifamily apartment buildings, in Dhaka city. The research investigated the basics of RWH, contextual information, i.e., hydro-geological, meteorological data of Dhaka city and the rules and legislations for residential building construction. The study also explored contemporary rainwater harvesting practices in the local and international contexts. On the basis of theoretical understanding, 21 sample case-studies, in different phases of construction, were selected from seven different categories of plot sizes, in different residential areas of Dhaka city. Primary data from the 21 case-study buildings were collected from a physical survey, from design drawings, accompanied by a questionnaire survey. All necessary secondary data were gathered from published and other relevant sources. Collected primary and secondary data were used to calculate and analyze the RWH needs for each case study, based on the theoretical understanding. The main findings have been compiled and compared, to observe residential development trends with regards to building rainwater harvesting system. The study has found that, in 'Multifamily Apartment Building' of Dhaka city, storage, and recharge structure size for rainwater harvesting, increases along with occupants' number, and with the increasing size of the plot. Hence, demand vs. supply ratio remains almost the same for different sizes of plots, and consequently, the size of the storage structure increases significantly, in large-scale plots. It has been found that rainwater can meet only 12%-30% of the total restricted water demand of these residential buildings of Dhaka city. Therefore, artificial groundwater recharge might be the more suitable option for RWH, than storage. The study came up with this conclusion that, in multifamily residential apartments of Dhaka city, artificial groundwater recharge might be the more suitable option for RWH, than storing the rainwater on site.

Keywords : Dhaka city, rainwater harvesting, residential plots, urban flood

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