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Assessment of wet precipitation and harvested rainwater quality from different types of roof materials in Hebbal urban area, Bengaluru - India

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The study is an assessment of the quality of wet precipitation and the harvested rainwater samples from different types of roof catchments such as reinforced cement concrete (RCC), galvanized iron, asbestos cement & galvalume sheets in urban area consisting of residential, commercial, downstream of industrial area with Bengaluru urban area. The precipitation samples were collected using wet precipitation collector by placing it on the terrace of the building. The harvested rainwater samples were collected in a staggered manner as first, second and third flush from all the roofs. The samples were analyzed for pH, TDS, conductivity, cations, anions and some heavy metals. Mean pH of wet precipitation was around 5.44 which is less than neutral pH 5.60, depicts slight acidic nature of wet precipitation. The study shows that lower pH in precipitation was controlled by acidic species of sulphate and nitrate. The concentration of harvested rainwater is more than the concentration of wet precipitation and varied for different roof catchments. The harvested rainwater concentration is within the acceptable limit of drinking water standards IS 10500:2012 except iron. pH, total dissolved solids, conductivity, sulphate, bicarbonate, nitrate, calcium, magnesium and bicarbonate concentrations have been identified to be higher in RCC roof than galvanized iron, galvalume & asbestos cement sheet. Some heavy metals have been found to be lower in RCC roof than other roof catchments. In most of the cases, the first flush of the harvested rainwater has higher concentration compared to second and third flush. The presence of pollutants can be attributed towards atmospheric dry depositions, anthropogenic activities, industrial emissions and leaching of roof catchment due to acidic nature of wet precipitation. The harvested rainwater can be utilized for groundwater recharge or any other purpose by providing pre-treatment after separating it from the first flush.

Biography

G P Shivashankara has completed his PhD from Bangalore University, India. He is a Professor in Department of Civil Engineering, P E S College of Engineering, Mandya, India. He has more than 31 years of experience in teaching and research fields. He is specialized in environmental engineering. He has guided several MTech and PhD students. He has published more than 20 papers in reputed journals and authored one text book. Serving as Principal Investigator, he has taken four sponsored projects to carry out the research work. On invitation, he has visited number of countries for paper presentation.

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