

Introduction of a Novel IoT Based and Automated Solution for Rainwater Harvesting in the Dry Zone

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A novel model is introduced to harvest rainwater, particularly for dry zone households with the intention to achieving multiple goals such as detecting rainwater quality at home, saving time, manpower, reducing water wastage and providing solutions to water scarcity. Under the current way of life, it is very significant to have an automated process for rainwater harvesting. The recently introduced automated rainwater harvesting system includes two tanks and two filters. The novelty of the proposed model is that it only contains one tank and a filter and it is a step forward and an upgrade of the existing system. First flush system exists to prevent the first raindrops from entering the system. The rainwater that drops into the water catchment system is captured by gutters. Rainwater passes through the conduits via an advance filter into storage tanks after removing debris by a coarse mesh. An IoT device capable of tracking water level and quality is connected to the top of the tank. It contains six sensors such as pH, Conductivity, Dissolved Oxygen, Turbidity, Temperature, and Ultra-Sonic sensor. Using GSM / GPRS and Wi-Fi modules, the sensor data in the Arduino Uno is sent to a server and displayed on a web dashboard. According to historical rainfall data (of past 15 years) analysed in the Kurunegala district, the dry zone receives a decent amount of sunlight throughout the year and the use of solar panels for power supply is suggested. The best economically and technically suited filter should be identified in the future.

Keywords: Automated rainwater harvesting, quality of rainwater, water quality sensors, Internet of Things