

WATER BALANCE OF WELLINGTON TANK IRRIGATED WATERSHED USING SCS CURVE NUMBER AND GIS

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ABSTRACT

Runoff is one of the most important hydrological variables used in most of the water resources applications. In this study, estimation of runoff for Wellington Reservoir is carried out using SCS and GIS techniques. The study area covers an area of 495.3 km² and physiographically the area is characterized by Western pediplains of entire area covered by Mangalur and Nallur blocks. This area is occupied by denudational landforms like shallow buried pediment, deep buried pediment and pediments. Central part of the district is characterized by sedimentary high grounds, elevation >80 m of Cuddalore sandstone of Tertiary age. This zone occupies part of Virudhachalam, and Kattumannarkoil taluks. The Soil Conservation Service Curve Number (SCS CN) also known as hydrologic soil group method was used in this study. This method is a versatile and popular approach for quick runoff estimation and is relatively easy to use with minimum data and it gives adequate result. From the study, monthly as well as annual rainfall and corresponding runoff were estimated. The curve number method, also known as the hydrological soil cover complex method, is a versatile and widely used procedure for runoff estimation. This method includes several important properties of the watershed namely, soils permeability, land use and antecedent soil water conditions which are taken into consideration. In the present study, the runoff from SCS Curve Number model modified has been used by conventional database and GIS for Wellington agricultural watershed in Tittaguditaluk, the Cuddalore district. Tittagudi had a population of 20,734. In this taluk, agriculture area is 823.74 km² and mean annual rainfall is 1110mm. Black soil is predominant soil type in this area and main occupation of the area is agriculture. The groundwater level of the study area ranges from 2m to 8m bgl (below ground level). The rainfall and land use data were used along with the experimental data of soil classification and infiltration rate for the estimation of the runoff for the study area.

KEYWORDS: Hydrological Soil Group, Land use and Land Cover, Rainfall, Runoff, SCS-CN and Wellington Reservoir