

DERIVATION OF SPATIALLY DISTRIBUTED UNIT HYDROGRAPH FOR BALISAN VALLEY WATERSHED USING GIS AND REMOTE SENSING TECHNIQUES

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ABSTRACT

Spatially distributed unit hydrograph had been derived for ungauged Balisan valley watershed using GIS and remotely sensed satellite image. Field observations were made regarding to land cover for better comprehension of the watershed characteristic and to increase accuracy degree of classification. Five major types of land covers were recognized and represented in the form of raster images of 50*50m resolution namely: exposed rocks 24%, woods and pasture 42%, pasture and grassland 7%, close seeded 21%, and bare soil 2%. Experimental work includes analyzing of 45 soil samples for different locations at Balisan Valley watershed. ArcGIS software was used to assign specific curve number (CN) value to each grid cell depending on both Hydrologic soil group and land cover. Arc GIS was also used for watershed delineation, display of results, and performance of analytical calculation.

The drainage basin was divided in to two systems for the purpose of travel time estimation; they were storage, and conveyance system. Storage system was dealt according to SCS Curve Number algorithm to subtract losses from total precipitation to find excess rainfall. The conveyance system was divided into two flow regimes, overland and channel flow. Special FORTRAN code was written to rout excess rainfall cell by cell to the catchment's outlet to allow the generation of successive isochrones. Time of concentration for the watershed was found to be 8.91 hr.

KEYWORDS: GIS, Remote Sensing, Watershed Area, Peak Flow



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