The study of Afin watershed land use and curve number changes by using GIS and RS

Abstract

Applications of geographic information systems and remote sensing to estimate runoff of watersheds have increased in recent years. This is mainly due to the fact that rainfall-runoff models are included both spatial and geomorphologic variations. In this research, runoff curve number map of afin watershed was prepared using geographic information system (GIS) and remote sensing and based on the factors of hydrologic soil group, land use, land cover and hydrologic conditions. The land cover map was determined using Normalized Difference Vegetation Index (NDVI) and classified to three groups: good, fair and poor. The watershed land use map was produced by satellite data using supervised classification method and maximum likelihood algorithm and according to research objectives, it is determind in 5 class of rain-fed, irrigated, poor-pastures, fair-pastures, massif lands. Software ERDAS and ILWIS were used to classify satellite image and produce land cover and land use maps. Then hydrologic soil group map was produced using field survey, watershed soil, slope, geology and land use maps. The combination of these maps in GIS and using SCS table, runoff curve number map for LANDSAT and IRS satellite images was obtained. The results show that during the period 2002 to 2010, land cover density has decreased and consequently the curve number of watershed and its runoff production potential has increased. The rain-fed cultivated area has decreased and irrigated cultivated area has increased.Also, the cultivated area of fair-pastures have decreased. The cultivated area of massif lands and poor-pastures have increased.

Keywords: Curve number- land use-Soil Hydrological Group – NDVI- Afin watershed

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