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The Effect of the Land Use/Cover Changes on the Floods of the Madarsu Basin of Northeastern Iran

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ABSTRACT

In order to understand the effect of the land use/cover change on the hydrologic regime of the Madarsu Basin in Golestan province of Iran, we selected the two floods of June 1964 and June 2003 with equal amount of rainfall but different rate of runoff. For these floods the closest time images of MODIS were selected. On these images we analyzed the land use/cover types and calculated their area and change rate between two floods. We also calculated the Curve Number (CN) for each land use/cover type according to the US Soil Conservation System (SCS) model. The results showed that: the intensity of the peak floods has increased from 1960 to 2002, and the natural lands of forests, rangelands, and bare lands have been decreased from 1960 to 2002. While the agricultural lands showed increase during the same period. The CN value has also increased during the study period causing the decrease of moisture retention capacity of the soil. As a result, despite the equal rainfall, the discharge rate of 2003 flood was about 10 times larger than that of the 1964 flood, which is the direct effect of the land use/cover change from the stable forests and rangelands to the unstable agricultural lands on the both soil moisture retention capacity and run off rate.

KEYWORDS

Land-Use/Cover, Destructive Flooding, Madarsu Bain floods, Gorgan River Floods, Remote Sensing and River Floods, Floods in Iran

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