

Impact of Landuse Change on River Floodplain Using Public Domain Hydraulic Model

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ABSTRACT

Floodplains are land areas adjacent to rivers and streams that are subjected to recurring inundation. Owing to their continually changing nature, floodplains and other flood-prone areas need to be examined in the light of how they might affect or be affected by landuse change. In this research, the effect of land use changes on floodplain is investigated. Major landuse change has occurred in Azaran watershed during the investigation period. Irrigated farmland has decreased by about 52%. However, bare lands, dry farm lands, and rangeland have increased by 12.40%, 17.25% and 14.46%, respectively. The extent of floodplain was determined based on the annual maximum instantaneous flood for different return periods using Hydrologic Engineering Centers River Analysis System (HEC-RAS) coupled with HEC-GeoRAS which is a tool for processing geospatial data in ArcGIS. Water surface profile data and velocity data exported from HEC-RAS simulations were processed by HEC-GeoRAS for floodplain mapping. It was found that the floodplain has increased due to land use change from 1956 to 2007. This study showed that floodplain areas in irrigated farmlands have increased by 151.99% and 68.63% for return period of 25 and 50 years, respectively.

KEYWORDS: HEC-RAS, flood, floodplain, azaran

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