

## Abstract

The unnatural factors that caused by human involvement in the catchment, development of municipal and residential along the river and the flood plain bed without regarding to the hydrologic and hydraulic conditions that govern the upstream watershed of the river are increased the flood risk. Study of the flood in order to planning, optimal utilization and management of natural phenomena is such the important issues of water resources management that it needs to have sufficient data on the hydrological behavior of the river and watershed. Among these policies is the flood Zoning in different return periods which can be an essential tool for developing strategies and reducing flood damage and legal means to control and land management and the environmental protection programs. Due to the geographic location of Iran, and located in a dry and semi-dry climate, having information and sufficient data is not possible. So in this context, several models have been proposed that The HEC-HMS hydrological model for flood simulation and the mathematical model of HEC-RAS for analyzing the hydraulic flow are most practical. The present study for zoning the flood of Shahrood rivers and Palbagh in Birjand city by using HEC-RAS mathematical model and geographical information system is discussed. In this study, the areas along the river bank examined in city of Birjand. In this context, after the preparation of maps and statistics and Hydrological data, to analyze, reconstructed and completing data was discussed then by doing field operation and preparation of crossing section, record properties and characteristics of main river and properties of different structures in river such as bridges was performed. In continued the simulation of precipitation – Birjand basin run off by using the HEC-HMS in the return period of 20,25,50,100 years is estimated and the results of the analysis model is shown that in Birjand city making limitation of the river section have been made without regarding to the floods with the different return period. As Palbagh river doesn't have 76.43 power of passing flow meter cubic per second with the 50 year return period and the areas in which was invaded the domain of river such as the residential and Commercial areas placed in the canal space, the installations of Azad university and Kohestan hotel in the space of Palbagh river will be submerged as well as Behesht Motaghin garage in the bed of Shahrood river, Stadium and radio sender station in neighboring of the Shahrood river, can be imposes numerous tangible and intangible damage to the people and organization. It was also plotted the zoning maps floodwater of the HEC-RAS model in a range of inside town in the Considered different return period.

**Keywords:** The peak flow, Floodplain determination and Controlling flood, Residential areas, Birjand city, HEC-RAS, ARC-GIS, HEC-HMS



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