Abstract:

Since floodplains and the riverbed sides are always at risk, many economical and social activities might be impressed. Thus a floodplain zoning is considerable. Floodplain zoning implys that how much of zones inundated. Hence, floods with different return periods considered and determined basis for the extent which floods spread on the plain. According to inundated zones, its corresponding risk was related to each other, so it has delineated and applied at flood risk management by Iso-risk Curves through the river. The flood routing has a great importance at floodplain zoning improvement whitin flood control solving as well as prediction. So the Muskingum-Cunge method which includes a hydraulic routing method is used. In this thesis, Baranduzchay River located in the Urmia lake basin at 3 kilometers river reach were studied between two Bibakran and Dizaj stations which are upstream and downstream, respectively. Due to fitting Gamma probability distribution and its minimum variance figure of 97.83, it has been selected as a proper statistical distribution. The annual peak discharge data of Baranduzchay River has surveyed during 53 to 92 years, which the appropriate Manning roughness coefficient by averaging 0.0325 as upstream coefficient and 0.0301 as downstream coefficient were both implemented at HEC-RAS software and its result including floodplain zones elevation extraction by the Muskingum-Cunge method based on floods with different return periods were obtained. After converting these zones to their corresponded risk for each return period has been delineated in ArcMap software through HEC-geo-RAS extension, then floodplain zones are defined. By the resulting floodplain zones, the Iso-risk Curves based on the different return periods with different useful period from 2 years to 75 years were extracted. In order to achive a general and practical risk model the Risk-Area-Period Rule Curve were introduced.

Keywords: Floodplain Zoning, Muskingum-Cunge, Risk, Baranduzchay River, GIS, HEC-RAS.

University of Zabol
Graduate School

Faculty of Water and Soil
Department of Water Engineering

A Thesis Submitted for the Degree of Master of Science
Water Resources Engineering

Hydraulic Floodplain Zoning based on the Iso – risk Curves
(Case study: Baranduzchay River Catchment)

Supervisors:

Dr. Seyed Mahmoud Tabatabayi

Dr. Ahmad Fakheri Fard

By:

Farnaz Mohammadi

February, 2017