



# **1 Construction of a Flood Risk Management System in a watershed by Using Statistical Models(Case Study : Kardeh Watershed)**

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By occurrence of climate change phenomenon and increasing of human's interference on global climate, two natural disasters such as drought and flood have effected on different parts of the earth. In the recent years, our country was alternatively witness in occurring of floods and sever droughts in most of places, specially twice occurring of these natural disasters, improve each other as because of severe droughts, vegetative coverage and humidity of soil are spoiled that is facilitation agent for flowing destructive floods. On the other hand, occurring of severe floods have caused destroyed of agricultural lands and lynching fertile soils and has amplified the effective of drought in these places. In a watershed which has high submergible potential, with a alternative and correct management, we can reduce the effects and damages of flood and use of it for increasing of water potential in this place, for example increasing of soil moisture and discharging of aquifer and increasing of water resources of lake of dams. For succession in these actions, an alternative and optimum flood risk management in that watershed is neccessary. Kardeh watershed is located near of Mashhad, and it is considered as a case study. The risk of flown floods in this basin is modulated with three flowing types of statistical models: 1) probability Distribution Function, 2) Linear Regressive Model, 3) Auto Regressive Independent moving Average (ARIMA) Models.

According to the results of model testing, the Probability Distribution Function couldn't be able to model the flood risk in the basin. The Regressive Model doesn't offer acceptable responses because it obeys from one general trend. ARIMA Time Series Models are tested in different stages and finally, ARIMA (1,2,3) Model offers the best statistical fitness. According to the conclusion from this research, by using of three statistical models, we can get a fit model for flood risk management for (Kardeh) basin, that it is usable into practical and conclusion of this research is expandable and usable for the other similar watershed basin.

***Keywords: Risk Management, Flood, Time Series, Modeling, Watershed.***