University of Zabol
Graduate school
Department of Water Engineering

The Thesis Submitted for the Degree of M.Sc.
(In the field of Water Resources Engineering)

Frequency Analysis of monthly and Monsoon Rainfall in Sistan and Baluchestan Province

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February 2020

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Abstract

The monsoon rainfalls are caused by the monsoon winds that blow from the Indian Ocean to the Indian subcontinent in the course of the months of June, July, August and September, causing a lot of rainfall in India and very often in southeastern Iran, i.e., Sistan and Baluchestan Province, and south of Kerman and south-east of Fars province. This study analyzes the monthly and annual rainfall of meteorological stations in sistan and baluchistan, which have monsoon rainfall in the summer, these stations include: Iranshahr, Sarbaz, Saravan, Nikshar, Ghasr ghand, Chabahar, Karvandar, Konark and Bampoor. To investigate the probability density function of the monthly monsoon rainfall, the hyfa (hydrological frequency analysis) software is used, which fits the required data to seven different probability distribution functions, including: normal, two and three parameter log-normal, the two parameter gamma, Pearson and log-Pearson type III and extreme value type I or Gumbel. The parameters of each distribution were estimated by the methods of moments and maximum likelihood. The best distribution function is chosen based on the mean square relative deviation and mean relative deviation tests. The results of this study showed that the monsoon and monthly rainfall data of Sistan and Balochstan province conform to a log-Pearson type III distribution. The results also indicate that 16 percent of Balochistan rains are of monsoon rains. The maximum percentage of monthly monsoon rainfalls occurs in Sarbaz.

Keywords: Monsoon rainfall, Statistical distributions, Log Pearson type III Distribution ؛ Two parameter gamma distribution ؛ Probability of occurrence.