FLOOD FREQUENCY ANALYSIS ON RIVER YAMUNA IN DELHI

A DISSERTATION

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS

FOR THE AWARD OF THE DEGREE

OF

MASTER OF TECHNOLOGY

IN

HYDRAULICS AND WATER RESOURCES ENGINEERING

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CANDIDATE'S DECLARATION

I, Amit Kumar , Roll No. 2K17/HFE/03 student of M.Tech. (Hydraulics and Water Resources Engineering), hereby declare that the project dissertation titled "Flood frequency Analysis on River Yamuna in Delhi " which is submitted by me to the Department of Civil Engineering, Delhi Technological University, Delhi in partial fulfilment of the requirement for the award of the degree of Master of Technology, is original and not copied from any source without proper citation. This work has not previously formed the basis for the award of any Degree, Diploma Associate ship, Fellowship or other similar title of recognition.

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CERTIFICATE

I hereby certify that the Project Dissertation titled "**FLOOD FREQUENCY ANALYSIS ON RIVER YAMUNA IN DELHI**" which is submitted by **Amit kumar**, 2K17/HFE/03, Department of Civil Engineering, Delhi Technological University, Delhi in partial fulfilment of the requirement for the award of the degree of Master of Technology, is a record of the project work carried out by the students under my supervision. To the best of my knowledge this work has not been submitted in part or full for any Degree or Diploma to this University or elsewhere.

Place: Delhi

Date:

Dr. S.Anbu Kumar

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ABSTRACT

Flood frequency analysis is necessary for evaluating the flood peak which is used to provide the information about the probability of occurrence of an event for a particular return period. In the present study used the statistical approach for analysis the River Yamuna at Wazirabad, Indraprastha and Okhla Station in Delhi. The data had collected in form of maximum annual discharge from the Flood & Irrigation Department of Delhi from Year 1978 to 2017. So, its having the sets of observation now using the annual maximum series which is uni variant. Firstly, check the sets of observation that is time independent or not,than its decided that the discharge data is random or not which defines that our data is suitable for further computation. In this analysis adopting the method of moments which includes the various distribution i.e., Extreme value type I Distribution, Log EV type I Distribution, Normal Distribution, Log Normal Distribution, Pearson Type III Distribution, Log Pearson Type III Distribution. After that plotting the graphical representation for their distribution & their (95% confidence Limits which clearly seen in the graphical approach of the distribution). In each distribution tried to find out calculate the discharge for different return period 10,25, 50, 100, 200,500, 1000 years & also calculate the upper bound & lower bound discharges are calculated&coefficient of determination is also found which describes the scatter of observation is narrow. If the coefficient of determination is approaches to unity its means the distribution is less scatter, than comparing their results on the basis of D INDEX method which describes the best fit distribution method for River Yamuna at three barrage in Delhi.

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AMS	Annual Maximum Series
PDF	Probability distribution funcition
CDF	Cumulative distribution function
C_K	Kurtosis coefficient
C_S	Skewness coefficient
C_V	Coefficient of variation
Cumecs	Cubic metres per second (m^3/s)
EV-1	Extreme value- type one distribution
K_T	The frequency factor corresponding to T
LP	Log Pearson
LP III	Log Pearson type three distribution
N	Number of years in historic period
PDF	Probability distribution function
Q_{max}	Computed flood flow for a selected recurrence interval
T	Return period
U	Location parameter
R^2	coefficients of Determination
$\bar{X}$	Mean
X_T	The magnitude of flood at required return period T
X_{tu}	Upper confidence limit
X_{tl}	Lower confidence limit
Y_T	Reduced variate
α	Scale parameter
β	Significance level
γ	ShapeParameter