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Guided By

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Project Title

HIGH INFLOW MITIGATION DURING HEAVY RAINFALL BY REDESIGNING THE STORM WATER DRAINAGE NETWORK OF UNJHA CITY

Abstract:

Rainfall-runoff relationship is one of the important parameter for designing storm water drainage. This research is mainly focused on by understanding existing drainage system and problems of Unjha township(8.1 Sq.km.), Dist. Mehsana, Gujarat, taking an effective step for redesigning storm water drainage system by analysing the topographic condition and discharge of rain water over the study area and reduce the effect of high inflow leads flooding. Depending on the rainfall pattern prospective discharge will also be formulated. Foremost, the rainfall data of 34 years (1981-2014) is collected from Gujarat state water data centre. Using rational method, discharge (Q) is determined with 34 years of rainfall data. Therefore, flood frequency analysis was done in which the values of peak daily rainfall were arranged in decreasing order and it is converted finally into hourly maximum values using the standard IMD empirical reduction equation. Discharge is determined as 25.056 $m3sec\diagup$. Secondarily, surface slope(in degree), DEM(Digital Elevation Model), contours and Land use/land cover map were generated in ArcGIS 9.3 from LISS-III(23.5 m.) and CARTOSAT-1 DEM(2.5 m.) satellite data of recent years to identify and assess topographic characteristics of Unjha township. Besides, Soil textural data was collected from NBSS-LUP (National Bureau of soil survey- Land use planning) for computing HSG (Hydrological Soil Group). Further these all parameters will be significantly used to compute Weighted Curve Number (WCN) by using SCS curve method for drainage design. Integrated discharge (Q) and DEM will classify the entire study area from maximum to low water inundated zone depending upon the topographic slope at each point. Also, based on previous to present storm pattern over the area prospective discharge will be computed finally. Keywords- LISS-III, GIS, DEM, SCS-CN, Standard Rational Method, HSG, Storm Drainage Design

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