Identify the Causes of Water Logging in Karve Nagar Area and Suggesting Remedial Measures

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Abstract **- Storm water Analysis & Flood Mapping means to study the reasons of Urban Storm Water logging in cities by the urbanisation of places. It happens due to increment of covering of the areas mostly by paved structures & decreasing the green cover and open spaces. It reduces the infiltrate land and causes flooding which occurs scouring and water logging problems. It is happening due to growth of population in the cities.**
So to prevent flooding impacts of storm water and use storm water to support green infrastructure and infiltrate into ground .To do this we have to collect rainfall data of past years and calculate runoff volume. We will be giving and suggesting certain Management Techniques regarding proper disposal of storm water to overcome these problems.

Index Terms **- Storm water, Runoff, Green Infrastructure.**

1.INTRODUCTION

Storm water is the water generated from rainfall which cannot infiltrate to the ground surface and join groundwater table.
Due to Rapid Urbanisation formation of impervious surface occur which results in the occurrence of flood. Due to increase in population storm water drainage facility becomes insufficient to cater for the requirement.
In cities waterlogging causes traffic jams, drainage problems, damaging roads, collapsing structures, Water pollution, water borne diseases and numerous other problems.

2.METHODOLOGY

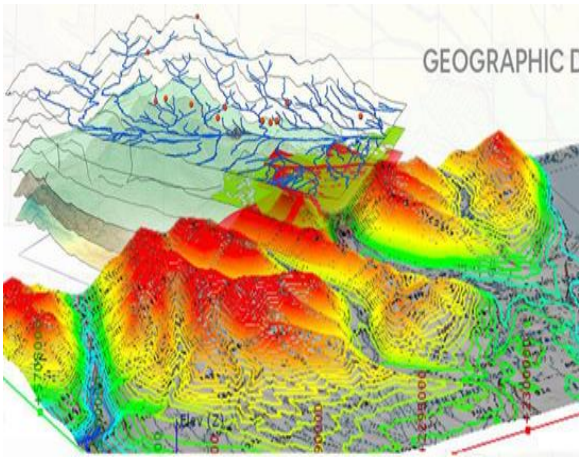
CALCULATION OF STORM WATER RUNOFF
1) Static method
Q = 10 C i A
Where, Q is stormwater runoff in mm3/hr, C is coefficient of runoff, i is intensity of rainfall in mm/hr and A is the area of drainage district in hectares.
Coefficients of various types of surface

Description	Runoff Coefficient C
Roads & Pathways	1.0
Residential / Industrial / Commercial, fully paved, high density	0.95
Residential / Industrial / Commercial, largely paved, medium density	0.85
Residential / Industrial / Commercial, moderately paved, low density	0.75
Open ground with bushes, steep slopes	0.5
Open ground / gardens / lawns, low to moderate slopes	0.3

Chart

2)Dynamic Method
Using GIS modelling software
In this work, GIS is used to draw the sub- watersheds in the selected catchment, to determine the slope and other characteristics and to determine the area of the sub-watersheds.

Vector Data
You can think of vector data as instructions for how to render data. The best way to visualize it is to think of it as a spreadsheet with columns that contain your regular data, but in addition it always has an extra column called “geometry”.
That column contains one or more coordinates that describe how to draw the point, line or polygon that represents that feature on the face of the earth



3. CONCLUSION

Strong stormwater management policies can protect one of our most important natural resources. The reduction of impervious surfaces can increase groundwater recharge and water quality. New strategies such as stormwater utilities can help fund much needed infrastructure repair and stormwater management projects. Conservation design and smart growth make open space and natural resource preservation a design priority rather than an afterthought. The recommended strategies in this paper can help strengthen the existing successful stormwater management ordinances.

4.ACKNOWLEDGEMENT

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We would also like to thank all the staff members of our department, without who se constructive suggestions and valuable advice, the simple idea, which had borne by us, would not have been able to blossom forth to give such a beautiful bloom.
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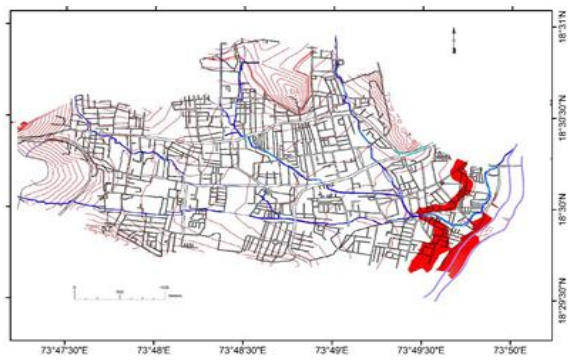
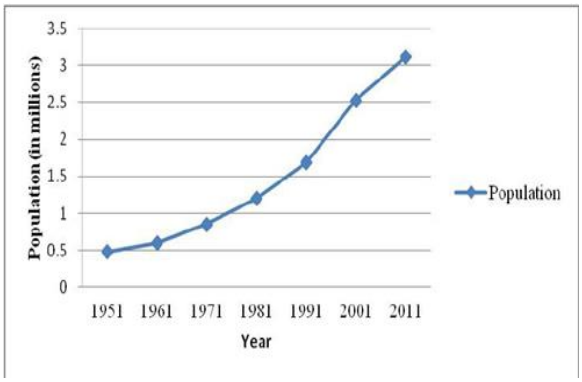
5.DATA REQUIRED FOR PROJECT

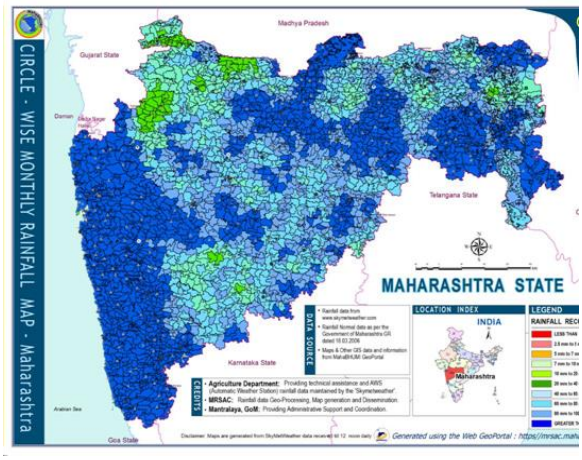
POPULATION GROWTH- Census 2011, ward office, opendata.gov.in.
DRAINAGE LINE MAP- PMC, DP 2015, R P.
RAINFALL DATA- IMD,NRSAC, MRSAC, rain gauage stations
CONTOUR MAP- mapsofindia.gov.in.

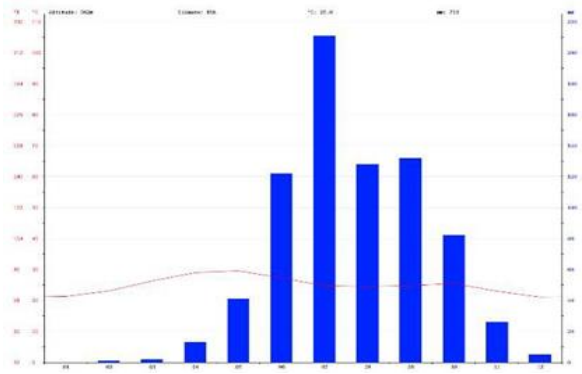


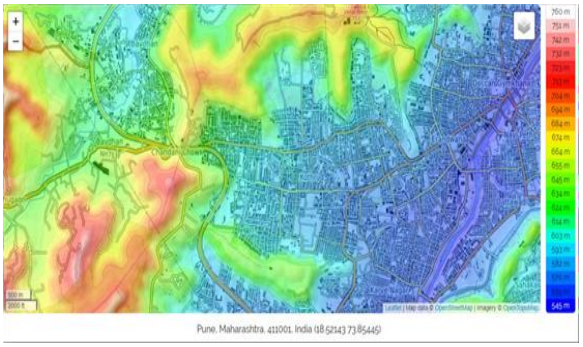
DRAINAGE LINE MAP



POPULATION GROWTH



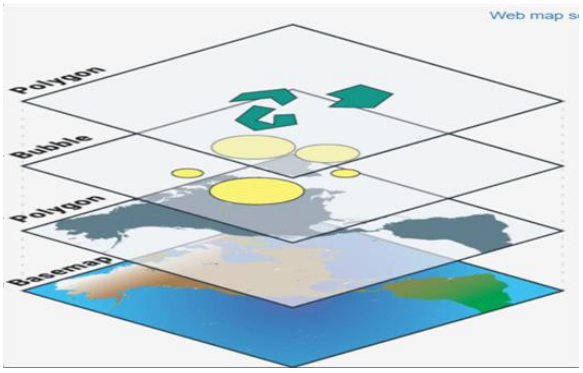

RAINFALL INTENSITY



CONTOUR MAP

PROBLEM STATEMENT

- WATERLOGGING CAUSED DUE TO SUDDEN TORRENTIAL RAINFALL IN KARVE NAGAR AREA OF PUNE CITY.
- HUGE AMOUNT OF RAINFALL WATER GETS WASTED WHICH CAN BE TRANSFERED
- TO SEWAGE TREATMENT PLANT FOR REUSE AFTER TREATMENT.



Adding Layers

Most maps are made up of multiple layers stacked up on top of each other. In the legend the name of each layer will be displayed alongside a checkbox that can be used to hide and display the layer.

Also the legend will contain a graphic that let's us know what the colors, fills and strokes on the map represent.

6.LITERATURE SURVEY

[1]TITLE: - Storm water Management a Case Study of Gandhinagar City

Author: - Sanjay B. Parmar, Prof. Vikash D. Bhavsar

Storm water management means to manage surface runoff. Its include controlling flooding and reducing erosion to improve water quality. This Strategy used in the Gandhinagar city to planning of prevents the impacts of Storm water. In this study to planning of use Best Management Practice to prevent impact of Storm water, and use of the Storm water to support to green infrastructure and infiltrate into ground. In this study to collect the past year rainfall data and calculate of runoff volume.

[2]TITLE: - To Study the Storm Water Drainage of Ahmedabad, Gandhinagar and Vadodara City

Author: - Kanan Y. Patel, Shibani Chourushi

This paper describes the study urban storm drainage performance indicators. The paper begins by presenting a general framework of objectives and performance indicators as logical intermediate steps between values and the decisions taken to reflect them. The paper then consider's practical approaches to performance and indicator measurement, based on field experience in India. General conclusions about drainage performance indicators are then presented, stressing the challenge of finding indicators which are valid indicators of performance.

[3]TITLE: - Development of Flood Routing Model Using Hec-Ras Software for Mutha River in Pune City

Author: - S. J. Chate, P. T. Nimbalkar

This paper describes the setting up of hydraulic model In HEC-RAS 5.0 for Mutha River in Study reach. Calibration and validation of hydraulic flood routing model based on the past data of the area under study. By using the developed model, Estimation of15 hydrograph for Worst scenarios of 75% and 100 % of spillway capacity flood release from Khadakwasla dam.

[4]TITLE: - Urban Flash Flood Modelling Using Remotely Sensed Data And Hec-

Ras: Pune Case Study

Author: - Rahul Nandurkar, Ravina More and Shailesh Deshpande

This paper used HEC-RAS model to estimate the flood depths in Pune city for various rainfall conditions in 2016 monsoon. The estimated water depths at various locations in Pune city indicate moderate flooding in isolated pockets of the city.

[5]TITLE: - 1d-2d Modeling of Urban Floods And Risk Map Generation For The

Part Of Hyderabad City Author:-Vinay Rangeri,C M Bhatt

This paper uses 1D model for pilot area is developed using storm water management model (SWMM) and coupled with 2D PCSWMM. A web based GIS platform INPPINS is used to geo reference the existing network details and exported to 1D SWMM model. The model is simulated for extreme flood event occurred in past. The simulation run results identifies overflowing drainage nodes and flood inundation maps and risk maps prepared. The flood risk maps identify the low lying areas which need immediate attention in case of emergency.

[6]TITLE:- India's First Real-Time Integrated Urban Flood Forecasting System For The City Of Chennai
Author:- Subhankar Karmakar
This paper uses Projection of extreme rainfall events rainfall from GCM outputs, using statistical and robust downscaling techniques. Combined 1D and 2D hydrodynamic flood modelling using MIKE flood Main deliverables: Design of an real time expert system of flood forecasting, 3-D visualization of flood propagation

[7]TITLE: - Reliability Assessment of a Storm Water Drain Network
Author: - R. L. Gouri and V. V. Srinivas16 In the analysis, runoff generated from sub catchments of the study area and flow velocity in storm water drains are estimated using Storm Water Management Model (SWMM). Results from the study are presented and discussed. The reliability values are low under the three failure modes, indicating a need to redesign several of the conduits to improve their reliability. This study finds use in devising plans for expansion of the Bangalore storm water drain system.

[8]TITLE: - Determination of Infiltration Rate And Soil Indices Using Double Ring Infiltrometer And Implementing It By Gis And Rs For Selected Areas In Zaheerabad, India
Author:-Kalam M A, M Ramesh
In this study constant infiltration rates of the soils under different soil conditions were studied, compared with the infiltration rates and were verified with IS code 15792-2008.

[9]TITLE:- Improved storm water management through irrigation rescheduling for City Parks
Author:-Jannatun Nahar, Su Liu, Jinfeng Liu In this work, a modeling and scheduling approach for an integrated storm water management and irrigation problem is presented. The primary objective is to simultaneously ensure that the green space is irrigated appropriately and the level of the storm water pond is maintained adequately. It is proposed to use closed-loop irrigation scheduling to achieve the objective. A steady-state model is developed to calculate the soil water storage for different irrigation amounts.

[10]TITLE- Causes of Urban Floods in India: Study of Mumbai in 2006 and Chennai in 2015
Author: - Archana Baghel
This paper will review the major urban flood events in India in recent past and highlight the major causes of these flooding as well as impact and consequences of the flooding with focus on the causes and consequences of flood in Mumbai in 2006 and Chennai in 2015.

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