# MANAGEMENT OF FLOODS IN URBAN AREAS: A CASE STUDY ON K & C VALLEY

**College** : SJB Institute of Technology

**Branch** : Civil Engineering

**Guide(s)** : Prof. H. Narendra Kumar

**Student(s)**: Ms. Spurthy N K

Mr. Rakesh K M
Mr. Shivappa Nayaka Y N
Ms. Harshitha G

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**Introduction / background:**

- The flooding of land or property in a built environment, especially in densely populated cities where rainfall exceeds drainage systems' capacity, is known as urban flooding. It is a manmade disaster.
- India's urban population is anticipated to reach 814 million by 2050.
- As a result, it is important for the government to focus on city master plans and urban renewal initiatives as essential components in order to reduce urban flooding.
- Urban floods are now a national problem in India, affecting mega and metropolitan areas almost every year.
- At various times, cities like Delhi, Mumbai, Patna, and Pune, were also flooded, bringing them to a halt for several days.
- Increasing trend of urban flooding is a universal phenomenon and poses a great challenge to urban planners the world over.
- As a citizen of India and as a civil engineer it's our responsibility to solve this problem and to find the best solution possible to manage the flood.
- Problems associated with urban floods range from relatively localized incidents to major incidents, resulting in cities being inundated from hours to several days.
- Therefore, the impact can also be widespread, including temporary relocation of people, damage to civic amenities, deterioration of water quality and risk of epidemics.

**Objectives:**

1. To map the temporal change of land use or land cover over the years.
2. To understand the hydro meteorological conditions through secondary data.
3. To develop the flood simulation 3D modelling.

4. To minimize the flood risk by developing strategies for the management of floods.

**Methodology:**

1. Collection of Secondary data from various government agencies (like CGWB, KSNDMC, IMD). Where CGWB - Central ground water board it deals with ground water and related issues, KSNDMIC - Karnataka state natural disaster monitoring centre it deals with weather forecasting, seismology and meteorological observations, IMD - India meteorological department - It maintain and update data base on droughts and flood parameters.
2. Base map preparation using GIS software.
3. Preparation of hydro meteorological maps using GIS software.
4. Development of flood simulation model using ARC hydro tool. (ARC hydro tool helps to build a dataset that can be integrated with water resources models)
5. Finally flood management strategies will be recommended upon proper rainfall, runoff and flood analysis studies.
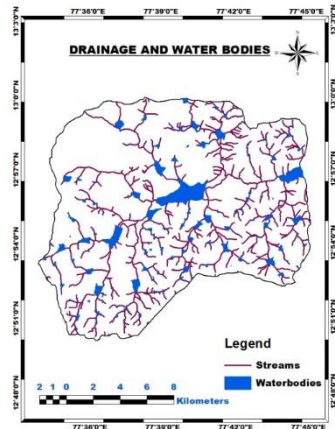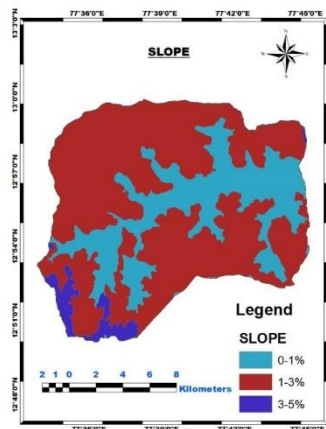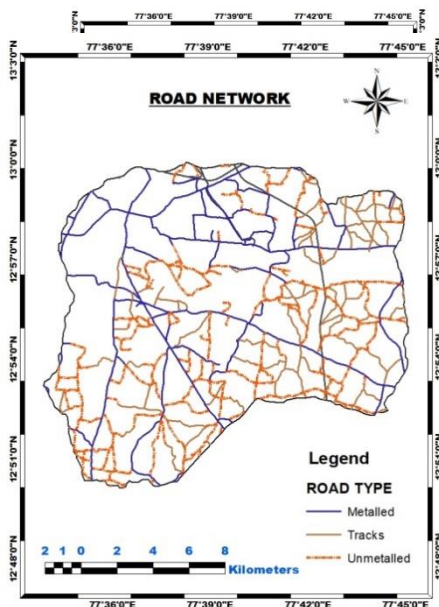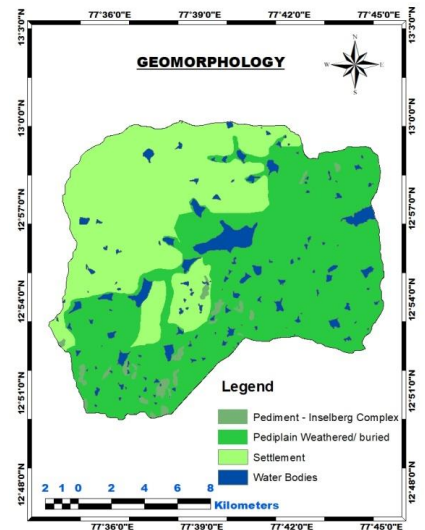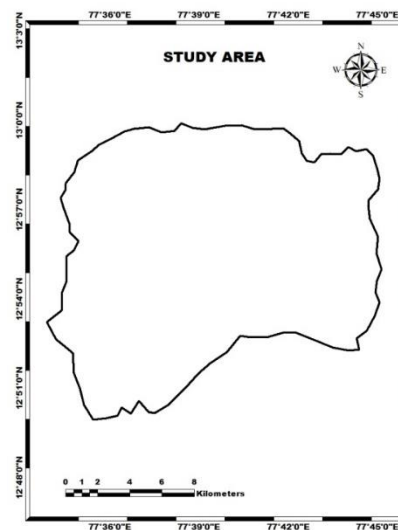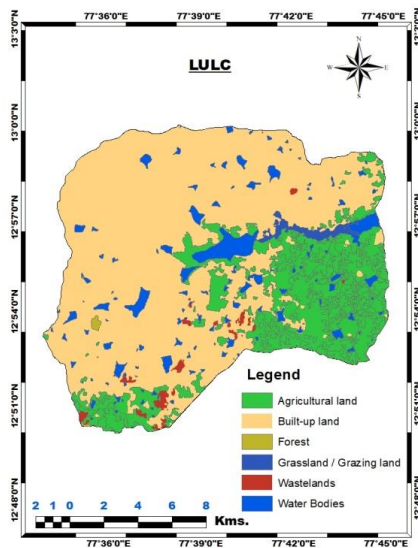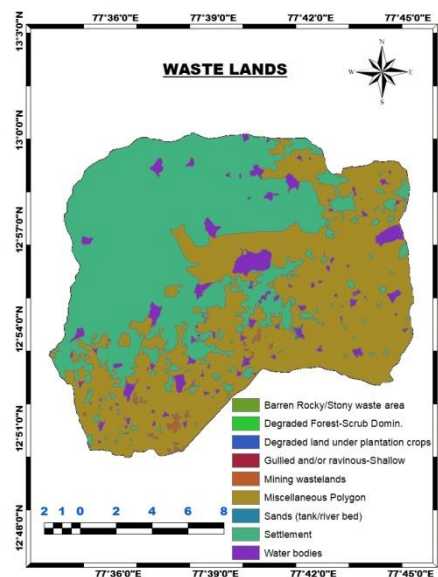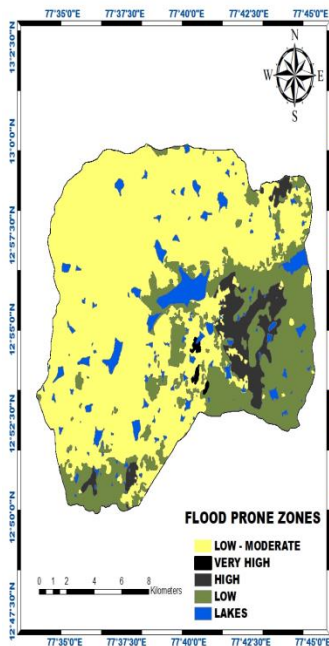
**Results and Conclusions:**

1. Floods are a natural phenomenon where overflowing of water occurs due to heavy rainfall. An urban flood occurs when an urbanised area gets flooded due to heavy rainfall and improper drainage of rainwater. It has a lot of ill effects including traffic jam, loss of homes, infrastructure, loss of food and sometimes even loss of life. This can seriously affect the ecosystem of that area. Hence it becomes important to study the occurrence of urban floods, and come up with prevention measures for the same.

2. For this project, the data has been collected from the directorate of Statistics and Economics. By using the **ArcGIS software** many maps are created, They are:

    a. Topographic map of study area, b. Drainage and water bodies map, c. Slope map, d. Road network map, e. Land use land cover map, f. Wastelands map, g. Geomorphology map, f. Geology map, e. Flood zonation map

3. Depending on these factors, the whole area is divided into 4 risk zones based on the intensity of damage urban floods causes in those areas. They are:
a. Low – Moderate risk zones in Indiranagar, Domulur, Halasuru.
b. Very high risk zones in Ibbaluru, Haralur colony, Ambalipura
c. High risk zones in Kasavanahalli, Haralur, Marathahalli.
d. Low risk zones in Siddapura,Varthur, Balagere

4. Analysis of data has been done along with study of these maps such as rainfall data analysis, comparison of land use, land cover pattern for the years 2015 and 2022.

5. Using these data and analysis, suitable mitigation measures have been suggested. In this project, useful results have been determined using ArcGIS software. This project can further be verified by using latest technologies. Results obtained can be necessarily used to develop and implement latest flood mitigation techniques.
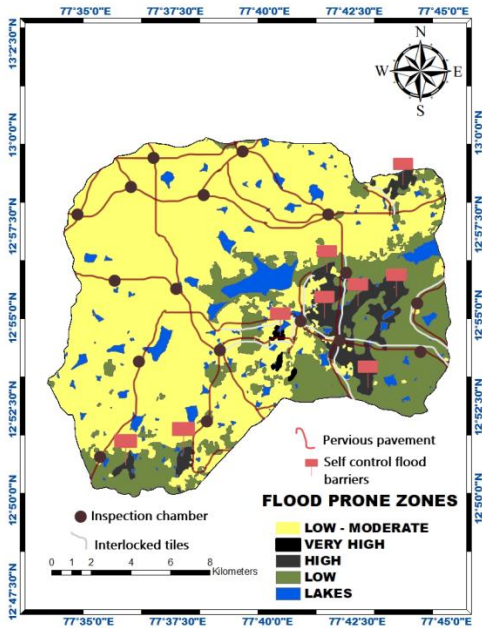
**Scope for future work:**

1. The qualitative analysis of flood management is carried out in detail but there is a scope for quantitative analysis for flood management.

2. Further work may be taken prior to sufficient field visits.

3. Drainage and pavement failure studies can be taken up.

There is an immediate requirement of flood control because of too much of anthropogenic activities.