

International Journal of Engineering Sciences & Research Technology

(A Peer Reviewed Online Journal)
Impact Factor: 5.164



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ABSTRACT

The Environment Agency invests substantial resources collecting hydrometric and topographical data using various techniques. This data is used for a wide range of purposes such as flood risk mapping, catchment flood management plans, shoreline management plans and integrated coastal zone management. These results provide essential information for day to day asset management and long term flood risk management. GIS applications in flood risk mapping range from storing and managing hydrological data to generating flood inundation and hazard maps to assist flood risk management. Over the last decade in particular, a great deal of knowledge and experience has been gained in using GIS in flood risk mapping. The amount to be spent can be reduced if flood hazard maps are available. Flood hazard maps can be proven beneficial to urban planner for future development of city and to disaster management authorities to carry out evacuation of people from flood affected areas in such conditions. The intent of this study is to generate flood hazard maps for a particular city or region by GIS tools and satellite images. This study will demonstrate the potential of GIS in civil engineering and in flood mitigation.

KEYWORDS: .GIS, QGIS.**1. INTRODUCTION**

Flooding, as a major natural disaster, affects many parts of the world including developed countries. Due to this natural disaster, billions of dollars in infrastructure and property damages and hundreds of human lives are lost each year. These hazards and losses can be prevented and reduced by providing reliable information to the public about the flood risk through flood inundation maps. Flood inundation maps are very essential for municipal planning, emergency action plans, flood insurance rates, and ecological studies. Samsun is the largest and densely populated in the north of Turkey. This area is almost under threat of flooding in each year. In this region, the main reason of devastating flood is the influence of the Mert River especially during March, April, and July and due to seasonal rainfall which eventually makes the district vulnerable to flooding. In addition, the human based constructions and the collapse of water retaining structures are among the main causes of flooding.

2. MATERIALS AND METHODS**Software used**

QGIS Desktop 3.6.2 for Vector and Raster based analysis such as MapOverlay, Proximity Analysis and for generating Flow Accumulation map, Raster Stream Network, Slope map, Contour map, Land use map, Stream Order map.

Dataset used

Rainfall Data of 5 years (2006-2011) (source: India Meteorological Department)
Field data has been generated using GPS for ground truth

Datas collected

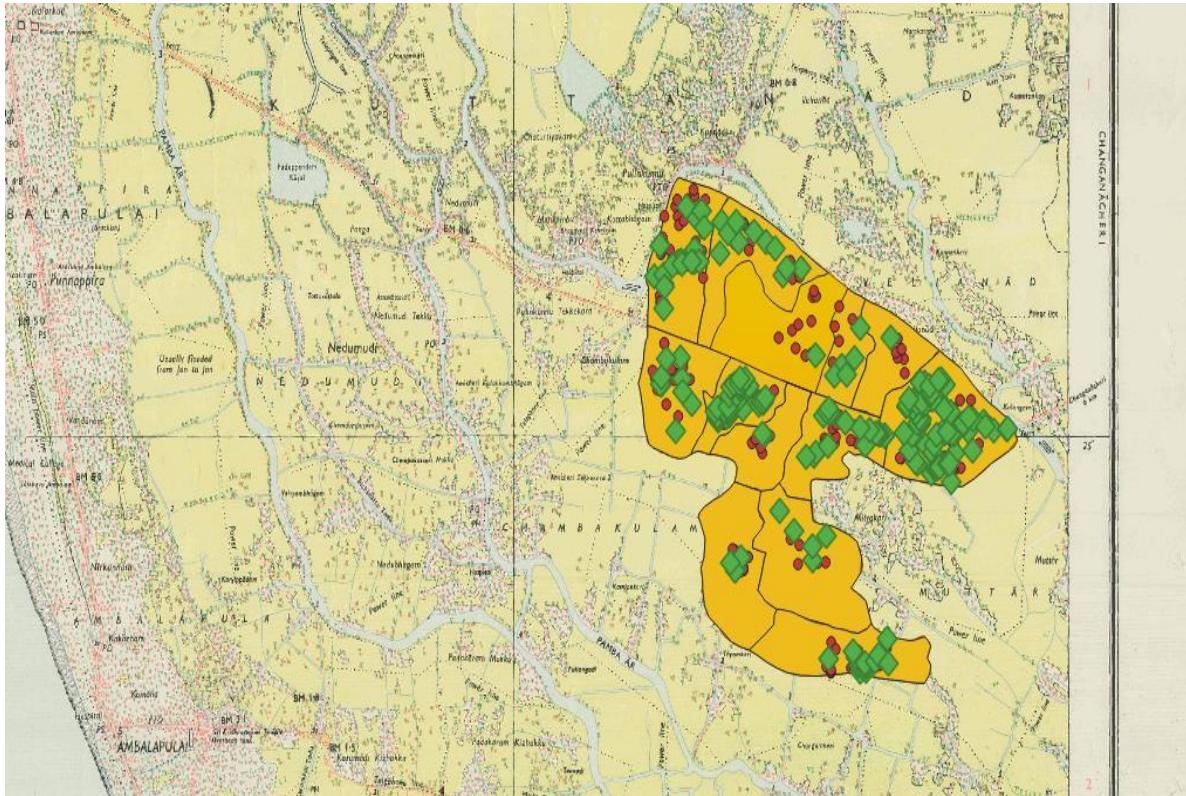
<i>Data</i>	<i>Source</i>	<i>Used for</i>
<i>Topographical map</i>	<i>Bhuvan site</i>	<i>Georeferencing</i>
<i>Panchayat boundary map</i>	<i>Ramankary panchayat</i>	<i>Digitalization</i>
<i>Rainfall data</i>	<i>Indian meteorological Department</i>	<i>Analysis</i>
<i>Latitude & Longitude</i>	<i>Using GPS coordinate application</i>	<i>mapping</i>

3. DIGITALIZATION RESULTS

Table showing the number of damaged houses in the collected data

WARD	No. OF HOUSES	No. OF DAMAGED HOUSES
1	144	44
2	100	20
3	110	15
4	116	25
5	107	13
6	159	66
7	37	19
8	101	15
9	67	13
10	112	5
11	119	20
12	105	41

4. MAP OF DAMAGED BUILDINGS



5. FUTURE SCOPE OF WORK

- To help the emergency teams to conduct assistance operations and rescue and evacuation during time of flood.
- To identify the zones of shelter and providing medical supplies during flood

6. RESULTS AND DISCUSSION

- Results of the project reveal the possible flood extent in a small part of the Ramankary Panchayat.
- During the project, we acknowledged that high rainfall is not only the cause of a levee break and flooding in the region.
- It is assumed that the natural flow of water and sediment from the pamba river located near the study area could be another strong force to encourage the frequent floods.
- Since we were not users of the GIS tools, a major portion of the time in this project was utilized for learning the GIS tools, which is also a Great achievement of the project.
- There are some limitations in this project too.
- First, the flood vulnerable buildings in this panchayat were only covered inside the study area
- Larger coverage of the area could visualize more details of the possible damage.
- To cover in larger scale is beyond the scope of this study.
- The second limitation was that the area of study was chosen arbitrarily and assumed the case of a levee break in peak discharge condition.

7. CONCLUSION

The project was completed successfully. Prepared the flood hazard identification maps using GIS with the different spatial and hydrological datas of the kuttanad region. Classified study area based on inundation maps. Identified the flood affected danger zones using computer modelling and GIS mapping. To help the emergency

teams to conduct assistance operations and rescue and evacuation during time of flood as best as possible using GIS maps.

8. ACKNOWLEDGEMENTS

We thank Mrs. Biji S, our supervisor, for helping us conceive the idea of the project. She also guided us implement the particular project. We thank her from the bottom of our heart for helping us in each step for completing the project. We express our sincere gratitude to Mrs. Biji S, Project Coordinator, Department of Civil Engineering, for the valuable suggestions and advices during the course of the work. We express our sincere gratitude to Mr. Shaha S, Head of the Department, Department of Civil Engineering, for the valuable suggestions and advices during the course of the work. We are happy to thank other faculty members, technical and administrative staff of the Department of Civil Engineering for their valuable support and heartfelt cooperation. We thank our family and friends for giving us mental support and enabling us to work efficiently on the project.

REFERENCES

- [1] Biswajeet Pradhan Flood susceptible mapping and risk area delin-eation using logistic regression, GIS and remote sensing In Journal of Spatial Hydrology, Vol.9, No.2 Fall 2009
- [2] P. A. BRIVIO, R. COLOMBO, M. MAGGI and R. TOMASONI Integration of remote sensing data and GIS for accurate mapping of flooded areas In Remote Sensing Department, IRRS, National Research Council , int. j. remote sensing, 2002, vol. 23, no. 3, 429441
- [3] D.S. Fernndez , M.A. Lutz Urban ood hazard zoning in Tucumn Province, Argentina, using GIS and multicriteria decision analysis El-sevier Engineering Geology 111 (2010) 9098
- [4] Vahdettin Demir and Ozgur Kisi Flood Hazard Mapping by Using Geographic Information System and Hydraulic Model: Mert River, Samsun, Turkey Advances in Meteorology Volume 2016, Article ID 4891015, 9 pages