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## Abstract

By this day, a more significant part of the worldwide population is living in metropolitan territories. Additionally, the residents are mostly obliging themselves in profoundly thick and populated spaces. By the coming year of 2050, the United Nations predicts for the degree of metropolitan citizenship to reach to the two-third of the worldwide population. In our nation, a decadal record of Census of India shows a remarkable rising trend in line with the worldwide pattern. Last such Census study of the year 2011 in India detailed that 31 per cent national population is living in urban communities. Evolution of spaces is through a village, to town, to a city, metro, and megalopolis. The expanding number of more significant measured human settlements is the outcome one can see. Urbanization appears to be inescapable and unavoidable. Urban communities work as development engines of a country. Larger settlements reflect typical character with somewhat extraordinary dependence on the chronicled association of the spot, its landscape and geological arrangement. Arrangement of the Constitution of India orders the urbanization to be a state subject matter. Aside from overseeing urbanization, the current instruments of lawful arrangements appear to have missing hints for metropolitan advancement puzzle. The work could identify the directions and quantify the extent of surface built-up in the study region of Surat. Remote sensing and GIS are used along with statistical modelling tools extensively for the research. The urbanization correlation with local weather parameters (temperature and rainfall) is established in the form of empirical-quantitative models. Projected values through the validated model are appropriate. The evolution of Surat urban region is dependent on land management tool of Development Plan and Town Planning Schemes. The tool procedurally does not consider the spatial impact and vulnerability due to natural hazard risks. The research identifies and quantifies the structural risk extent for the study region. Mitigative Development Plan modifications are proposed in light of existing legislation as an outcome of the research. The work claims to avail measures for mitigating sea-surge flooding risk to more than 26.9 Lac citizens and properties developed in an area of 314.75 sq. km. The exploratory research work is attempted by obtaining open-source remote-sensing, GIS data and open-source tools as QGIS, JASP availing an opportunity of wider process replication.

This PhD thesis will help in implement a process-based research addressing modifications in land management planning practices for urbanizing regions. The findings of process shall extend the benefit to the community through reduction in vulnerability due to natural hazards.

### List of Publications:

- 1) Bhatt, B. V., & Sharma, N. D. (2020). Spatio-temporal analysis of urbanization in Surat region. *International Journal of Scientific and Technology Research*, 9(2), 4939–4945. Retrieved from <http://www.ijstr.org/final-print/feb2020/Spatiotemporal-Analysis-Of-Urbanization-In-Surat-Region.pdf> ISSN: 2229-5518
- 2) Bhatt, B. V., Kumar, S., & Sharma, N. D. (2020). Amidst the Governance Challenges in Environmental Management and Sustainable Urbanization in Surat. In T. M. Vinod Kumar (Ed.), *Smart Environment for Smart Cities* (pp. 349–384). Singapore: Springer Singapore. [https://doi.org/10.1007/978-981-13-6822-6\\_9](https://doi.org/10.1007/978-981-13-6822-6_9) eISBN: 978-981-13-6822-6, ISBN: 978-981-13-6821-9, Series ISSN: 2198-2546