

Research Abstract

My research broadly focuses on leveraging Geographic Information Science (GISci) and spatial analysis methodologies to address pressing socio-spatial challenges across diverse fields including regional development, urban studies, disaster research, sustainability, land use change, and climate change. By integrating GISci with social science frameworks, the aim is to bridge disciplinary gaps and enhance the understanding of complex social phenomena with spatial dimensions. Through interdisciplinary collaboration, the research seeks to develop innovative approaches for analyzing spatial patterns, assessing socio-environmental impacts, and informing evidence-based policy interventions aimed at fostering sustainable development and resilience in the face of global challenges.

My MPhil research focused on analyzing the dynamics of land use and its determinants of change in the Bhagirathi Basin, Uttarakhand. This involved assessing the impacts of land use changes on the region and using Land Change Modelling with IDRISI Selva to predict future scenarios. Additionally, I investigated the social, economic, and physical vulnerabilities stemming from these land use changes. Further exploration centered on the Uttarakhand flash flood tragedy of June 17, 2013, its repercussions on low-lying areas, and the exploration of sustainable development approaches for disaster management.

During my PhD studies, I delved into the Impacts of Ecosystem Services on Livelihoods in the National Capital Region. Ecosystem services refer to the benefits society derives from ecosystems, including necessities like food, water, and timber, as well as functions such as water and climate regulation and soil formation, all crucial for human welfare and well-being. With population growth leading to urbanization and expansion of human settlements, urban expansion in metropolitan regions has resulted in the development of urban conglomerates, exerting pressure on land and its resources. This pressure leads to land degradation, compromised water quality and quantity, infertile soil, and air pollution, ultimately affecting people's quality of life as many depend on ecosystem services for their livelihoods. The haphazard urban growth in and around cities exacerbates the degradation of these services, particularly affecting vulnerable peri-urban regions due to the lack of proper planning and the extension of urban colonies in the periphery, which disproportionately stresses local communities, especially marginalized populations.

Future Trajectory

It is a well known fact that human beings have introduced substantial changes in global ecosystems since the advent of industrial revolution. These changes include accelerated deglaciation, degradation of soil, irregular but intense weather events, higher incidence of disasters, adverse impact on agriculture etc. These changes are destabilizing the balance between various components of ecosystem. Since human race is one of the many components, the negative feedback we receive from nature is going to present us with a lot of social, economic and political problems. Therefore, I intend to focus on solutions to these problems so that we may adapt better to global, regional and local changes in society, economy and polity. As a geographer, I wish to bridge the gap between science and humanities.

I wish to teach following courses for skill enhancement of my students to further the research in above-mentioned field.

- Course I: Ground Truth: Social Implications of GIS
- Course II: Disaster Management
- Course III: Human-environment interaction and Development