

## **ABSTRACT**

Climate change and urbanization have exacerbated environmental hazards and affect health, safety, and welfare of society. *Resilience thinking provides a foundation for landscape planning framework to investigate social-ecological drivers and outcomes in the linked social-ecological systems. Transdisciplinary approach includes organizational, institutional, and interdisciplinary hierarchies and collaborations and plays an important role in redefining issues and building consensus for achieving common goals. The proposed transdisciplinary planning framework aims to build adaptive capacity through a revolving feedback loop. A case study from the Boston Metro Area Urban Long-Term Research Area-Exploratory project demonstrated the use of the proposed planning framework. Growth scenarios were developed through transdisciplinary planning process. The study evaluated planning innovations in growth strategy (e.g., infill redevelopment) and green infrastructure (e.g., stormwater detention) for climate change adaptation. Climate change-induced flooding risks, served as social-ecological outcomes, were measured through integration of flooding hazard index and social vulnerability index under multiple climate change and land use scenarios in the Charles River watershed. The results from empirical study support the role of integrating anticipated climate change-induced social and ecological impacts into spatial planning decisions to mitigate impacts, minimize exposure of hazards, and increase adaptive capacity. In addition, innovations in green infrastructure planning and design serve as climate change adaptation strategies. Applying the transdisciplinary planning framework, the findings can be used to inform decision-making and prioritize climate change adaptation strategies to serve the needs of the socially vulnerable groups. The study provides an insight of integrating transdisciplinary approach in landscape planning for building social-ecological resilience.*