Integrating "Sponge City" Principles into Coastal Greenway Development: A Case Study in Shenzhen

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Integrating "Sponge City" principles into coastal greenway development emphasizes using nature-based solutions to manage stormwater, reduce coastal flooding risk, and enhance ecosystem resilience. By designing greenways with "Sponge" strategies, such as rain gardens, wet forests, constructed wetlands, and floodable zones, excess stormwater can be captured, infiltrated and utilized, helping mitigate the impact of sea-level rise and storm surges. These strategies also improve water quality and support biodiversity, creating multifunctional greenway corridors that offer environmental, social, and health benefits.

This study aims to explore innovative "Sponge City" strategies in coastal greenway development through a case study - the Yangmei Keng Seaside Greenway in Shenzhen, China. This 11-kilometer greenway is situated on the Dapeng Peninsula at the eastern tip of the metropolis. This region suffered considerable damage during Typhoon Mangkhut in 2018. In 2019, an extensive shoreline restoration project was launched through international design competitions. The "Triple Dike Strategy", an innovative integrated approach was adopted in demonstration areas along the Yangmei Keng greenway to reorganize the shoreline for ecological rehabilitation, oceanfront recreation, and coastal defense. Instead of rebuilding a traditional seawall along the coast, the "Triple Dike Strategy" established three protective areas, carefully embedded in existing conditions and adapting to the specific future needs of each area. The "inner" dike area acts as 'rain gardens'. The "middle" dike zone is composed of a series of seawalls with plaza spaces and connections to oceanfront walks. The "outer" dike area is a showcase of "wave gardens" with robust beach vegetation and rocks, mitigating the impact of storm surges (KCAP n.d.).

This study adopts primarily qualitative data collection methods like designer interviews, field observations, and document analysis, to gain a comprehensive understanding of the coastal greenway and shoreline restoration project. It intends to examine the "Spongy" performance of the integrated greenway development, offering valuable insights and lessons learned.

References

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Authors Biography

Hongbing Tang, PLA, ASLA, LEED-AP, co-founder of LANDD International LLC and Assistant Teaching Professor in Landscape Architecture at University of Rhode Island, has over 20 years of professional experience. She is a PhD candidate in regional planning at University of Massachusetts, where she holds MLA and MRP. She received her B. Arch. from Tsinghua University in China. Hongbing has designed and managed a wide range of projects in the U.S. and China. She brings a unique cross-cultural perspective to her practice, teaching and research. Her work has engaged with local and global issues regarding sustainability, climate resilience and inclusive design.