

Integrating UGI in Dense Urban Areas- A comparative analysis of Nordhavn in Copenhagen and Punggol in Singapore

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Urbanization is rapidly reshaping cities worldwide, with projections indicating that by 2050, up to 70% of the global population will reside in urban areas. This shift poses significant challenges, particularly in densely populated regions where limited space and land use conflicts often prioritize economic growth at the expense of human and environmental health. In response, international organizations such as the United Nations and the European Union have highlighted the critical importance of incorporating natural elements into urban environments to create healthy, livable, and sustainable cities.

Urban Green Infrastructures (UGIs) have become crucial in addressing the challenges of urbanization, particularly in fostering social cohesion, supporting economic resilience, and enhancing cities' adaptability to climate change. Initiatives like the Green Surge, funded by the European Commission, highlight the importance of UGIs in maintaining livable and ecologically balanced urban environments as they grow denser. The relevance of UGIs spans various governance levels, from the United Nations Sustainable Development Goals, particularly Goal 11, to the European Green Deal and the EU Biodiversity Strategy for 2030, all aiming to enhance urban resilience, biodiversity, and pollution management. Nationally, Denmark has integrated UGIs into urban planning to combat climate change and improve quality of life, as seen in its National Planning Report and local adaptation plans. Locally, Copenhagen's Urban Nature Strategy and Municipal Plan emphasize the critical role of UGIs in creating a sustainable and livable city.

This study is drawing on insights from a broad spectrum of experts. Through 13 in-depth interviews conducted in Copenhagen and Singapore, the research integrated perspectives from academics, urban planners, and grassroots volunteers. Participants included professors from the Department of Public Health at the University of Copenhagen, representatives from the Danish Architecture Center, and experts from Singapore's Center for Liveable Cities and the National Parks Board. Additionally, local volunteers involved in rooftop gardens and composting initiatives provided valuable grassroots perspectives. These diverse contributions enriched the research, shaping its analysis and conclusions from multiple angles.

The findings of the study reveal several shortcomings in Nordhavn's current urban planning, particularly in integrating urban nature and promoting social inclusion. There is a noticeable gap between local strategies and national objectives, with key issues including inadequate connectivity, such as missing corridors and steppingstones, and insufficient integration of green elements into grey infrastructure. Moreover, the study identified a predominantly top-down approach to local planning, which hampers the effective incorporation of UGIs.

To address these deficiencies, the study suggests making UGIs more affordable and attractive for developers, as seen in cities like Singapore and Vancouver, where financial incentives and development bonuses are offered for green infrastructure. Improving the quality and connectivity of existing UGIs is also essential, as many lack biodiversity and ecological value. The planning process should incorporate both people and biodiversity, balancing environmental, social, and economic goals. Lastly, mandating UGI integration, as done in Singapore with the Green Plot Ratio, ensures that developers replace lost greenery and include adequate green spaces in their projects.

In conclusion, this study underscores the potential of Nature-Based Solutions, particularly UGIs, to mitigate the adverse effects of urbanization and enhance urban living conditions. While UGIs offer numerous benefits, they should be considered part of a broader solution to urban challenges, focusing on inclusivity, connectivity, accessibility, and fostering connections between people and nature. The insights gained through this research aim to guide the implementation of UGIs in Nordhavn, promoting a shift toward a genuinely sustainable urban future, particularly through improved governance and community involvement. By learning from successful models in cities like Singapore, Nordhavn can move closer to becoming a truly "Sustainable City of the Future."