

## ABSTRACT

*PermaCity: Developing an ecological urban open-space paradigm*

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*Major thesis for the MSc. of Landscape Architecture and Planning*

*Specialisation: Landscape Architecture*

As a problem-solving profession, landscape architecture faces an urbanising world challenged by an increasing, interrelated environmental meta-crisis. Landscape architecture ecological design theory is considered the appropriate basis for design response, yet lacks standardised applied methods. To address this, an established 'bottom-up' agroecology design toolbox called permaculture was selected and tested for suitability. Wythenshawe, Manchester, UK, provided the live project area and client concept of 'Manchester's Garden City'. The resulting design presents a scenario envisioning an ecological urban open space paradigm of multi-functional, productive urban landscapes with: integral reconciliation ecology, self-sustaining plantings, low-carbon maintenance, local governance, food security, and climate robustness. Permaculture systems-thinking supported increased design complexity through use of multi-functional elements with multi-layered systems, eco-mimicry, and productivity - successfully addressing multiple global issues at local level. It compensated for deficiencies in McHarg's layering method by using flow between landscape elements and assigning all landscape a human value.

Three sub-sites in a novel typology emanating from the research - Rurban, Suburban Matrix, and Urban Core - illustrate how the design's functions could be met through design systems applied synergistically across the project area. Symbiotic functions of spaces and multiple yields were designed into conventionally unproductive sites: parkland where leisure facilities benefit landscape health, and livestock manage grassland; suburban greenspace addressing food security, low-carbon maintenance, and increased ecological matrix uniting Lynch and Forman's theories; while urban hardscape integrates forest garden principles. In order to balance conflicting pressures on urban land through growing population, peak oil, and diminishing biodiversity, there is an established urgency for ecological design to become convention. This, and the design results of systems-thinking strategies generating multiple benefits from open space networks, clearly depends on suitable and replicable design methods. It is concluded, based on research results, that permaculture merits further consideration as one such landscape architecture ecological design methodology.