Towards a more sustainable transition of Sponge City: from Grey to Green

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Mapping the research landscape of nature-based solutions in urbanism

- Nature-based solutions (NBS) is an innovative concept that describes policy actions that mimic the processes of natural ecosystems, popularised principally in the European Union. Based on an assessment of extant NBS literature we offer guidance as to the future direction of the field.
- Methods: a bibliometric analysis and thematic analysis for NBS studies in urbanism.

Results:
- Research on NBS has increased rapidly in the last few years (2015-2020), and 55% of NBS publications focused on urban contexts.
- NBS studies were found to relate strongly with other concepts such as 'Ecosystem Services', 'Green Infrastructure', 'Climate Change', and 'Risk management and Resilience', which themselves align with four major thematic goals set by the European Commission.
- Within NBS scholarship, a variety of sub-themes have emerged, namely 'Greening', 'Urban Development', 'Water', 'Wellbeing' and 'Governance'.
- The amount and thematic focus of NBS research has been unevenly distributed around the world.
- Analysis of emerging trends showed recent increases in topics such as adaptive governance of NBS, and incorporating social justice in sustainability transitions.

Key words: Nature-based solutions; Sustainable urban development; Green Infrastructure; Ecosystem Services; Climate Change; adaptive governance.

The Sankey diagram indicates the relationship among study continents, European Commission four thematic goals, specific goals and study methods.

Identifying enablers and barriers to the implementation of the Green Infrastructure for urban flood management: A comparative analysis of the UK and China

Motivation:
- Currently, the implementation of GI is restricted to small spatial (site specific) scale and facing several constraints, that limited its fuller functions and potential.
- It is beneficial to learn the comparative findings and experiences from both countries, for stakeholders to improve current GI practices.

Methods:
- We identified enablers and barriers of SUDS in the UK and SCP in China, through 12 in-depth semi-structured interviews.

Results:
- Enablers: mainly multiple benefits with reducing the stormwater runoff and alleviating peak discharge in the drainage system; social well-being and climate adaptations.
- Barriers: financial, biophysical and socio-political circumstances in both cases.

The main differences between GI approaches in the UK and China from the interview analysis

- In China, it tends to be top-down, with less public and stakeholder participation, meaning that projects tend to get pushed through faster, though there is a corresponding lack of transparency.
- The UK tends to get more stakeholders involved in the project, which helps to create more initiatives from the bottom up. However, the overall process is slower. The UK noted that although the participation process in the UK is able to include a wide range of opinions from stakeholders, it could be a challenge.

The way for SCP in the future

- The tax system in the two countries is different in terms of generating project funds from the taxpayers.
- In China, funding comes mainly from government grants, and public and stakeholder participation, meaning that projects tend to get pushed through faster, though there is a corresponding lack of transparency.
- The UK tends to get more stakeholders involved in the project, which helps to create more initiatives from the bottom up. However, the overall process is slower. The UK noted that although the participation process in the UK is able to include a wide range of opinions from stakeholders, it could be a challenge.

The progress of urban water management development in China from before 2000 to 2030 (source: Lei Li, adopted from Qi et al., 2020)

References: