Enhancement of Urban Design with Blue Green solutions

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Enhancement of **Urban Design** with **Blue Green** solutions

| Blue & Green Urban Design | – urban water (blue) and vegetation (green) infrastructure  
|                          | – inter-disciplinary process of designing and shaping the cities (buildings, streets and public spaces)  
| Concept                  | – interactions of BG solutions with all urban Ecosystem Services  

**Principal aim**

In order to facilitate **adaptation of urban areas** to climate change and weather extremes via highlighting importance of ‘building with nature’, the research aim is to:

- encourage and to **enhance changes in urban design**, architecture and landscape architecture practice.
Urban Design process

Strategy of development

- Master / Urban planning
- Urban design

CONCEPT DESIGN

- Planners
- Decision makers
- Government
- Developers

Planning application

- Architects & Multidisciplinary team
- Environmental engineers

Building design
- Landscape design
- Environmental assessment

Scale

- Region
- City
- Neighbourhoods
- Block / Parcel

City development
Software coupling

Water \rightarrow \text{Urban heat island}

SWMM \rightarrow \text{ENVI-met}

Implementation of BG Solutions quantification of Water availability for storage and reuse

Availability of water will influence performance of the vegetation for oudside air and surface temperature

[soil moisture, open water bodies, water availability for vegetation]

[ surface and air temperature, radiation wind speed, anthropogenic pollution]
Optimisation of the Ecosystem performance indicators

Optimisation method

- SWMM Water Management → 25%
- ENVI-met Outdoor Temperature → 60%
- Optimisation model Cost-benefit analysis → 15%

Final outcome is to set of BGD guidelines for architects and urban designers.
Published papers

Conference publications

- Blue-green Integrated Modelling Solutions In Urban Planning And Architectural Design, PLACES AND TECHNOLOGIES, BELGRADE, 2014
- BLUE GREEN DREAM AND DAYLIGHT, PLACES AND TECHNOLOGIES, BELGRADE, 2014

JOURNAL

- SPATIAL CRITERIA FOR MICROCLIMATE COMFORT OF COMMUNAL OPEN SPACES IN RESIDENTIAL BLOCKS, CAMBRIDGE PUBLISHER, 2014
- Principles of climate sensitive urban design analysis in identification of suitable urban design proposals, Energy and Building, 2015