Incorporating Green Infrastructure into Urban Realities

Potentials of Urban Brownfields

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Brownfields in Urban Development

Brownfields are unplanned sites of a transitional nature. As a form of available land, they are offering a range of different potentials for urban development, for example as sites for revitalization and new buildings or for greening.

Ecosystem Services of Green Urban Brownfields

Particularly brownfields more or less covered by vegetation, can supply diverse ecosystem services. Their various stages of ecological succession are associated with a range of habitat, regulatory and socio-cultural services. As green infrastructure, brownfields can play a vital role in dealing with urban challenges as adapting to climate change, promoting biodiversity and fostering healthy urban environments.

Habitat Services

Unsealed brownfields undergo a process of ecological succession; specific stages can be distinguished. In order to estimate their habitat services, different biodiversity parameters can be described:

- Stages of ecological succession:
  - pioneer vegetation: rapid succession; sites with spontaneous vegetation are rarely liked.
  - ruderal vegetation: persistent ruderal species, sites with spontaneous vegetation are rarely liked.
  - herbaceous vegetation: species, species requiring complex habitats, species, species with decreasing populations.
  - tree vegetation: species, species requiring complex habitats, species, species with decreasing populations.

- Biodiversity parameters of the four stages of ecological succession on green urban brownfields:
  - Regenerative potential:
    - structural diversity: some structuring potential, some structuring potential, richly structured, richly structured.

Recreation Services

Analysis of the use of green urban brownfields showed a wide variety of actions, which underpin their recreation potential. Nevertheless traditional notions of urban greenery (wooded areas, parks etc.) were most popular. Sites with spontaneous vegetation are rarely liked.

Microclimatic Regulation Services

The results of microclimate modeling indicate that both, several urban green spaces and green urban brownfields have potentials to regulate the local temperature. The average cooling effect of green sites of size 1 ha ranges between 0.1 K and 2.1 K referred to an asphalt covered site.

Implementation

Options for reusing brownfields as green space and qualitative evaluation of their potentials to provide habitat services, micro-climatic regulation services and recreational services:

- ++ “well suited”, + “suited”, - “unsuited”, +/- “detailed investigation of individual site necessary”.

Perspective

In view of the existing potential of these last remaining undeveloped sites in the urban landscape, brownfields should not be subject to excessive planning. Instead, urban planners should aim for a flexible exploitation of brownfields in order to offer room for maneuver to react to future development challenges.

Literature


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