Nature-based Solutions to Climate Change in Urban Areas and their Rural Surroundings

Linkages between Science, Policy and Practice

Prof. Dr. Beate Jessel

President of the German Federal Agency for Nature Conservation (BfN)
European Conferences on Biodiversity and Climate Change

2011: Horst Korn, Katrin Kraus and Jutta Stadler (Eds.)
Proceedings of the European Conference on Biodiversity and Climate Change – Science, Practice and Policy –

2013: Horst Korn, Jutta Stadler, Aletta Bonn, Kathrin Bockmuhl and Nicholas Macgregor (Eds.)
Proceedings of the European Conference „Climate Change and Nature Conservation in Europe – an ecological, policy and economic perspective“

2015: Aletta Bonn, Nicholas Macgregor, Jutta Stadler, Horst Korn, Sarah Stiffel, Katrin Wolf and Nikki van Dijk
Helping ecosystems in Europe to adapt to climate change

2015: Nature-based Solutions to Climate Change in Urban Areas and their Rural Surroundings - Linkages between Science, Policy and Practice
EUROPEAN CONFERENCE, BONN / GERMANY, 17-19 NOVEMBER 2015
Severe effects of climate change on urban inhabitants and urban nature:

- high temperatures ("heat-island-effect"), heatwaves
- drought
- stormwater runoff, flooding
- (invasive) alien species
- ...

AIMS of the conference:

- foster linkages between science, policy and practice regarding nature-based solutions to meet the challenge of climate change in urban areas
- + further multiple-benefits
BfN as scientific advisory body of the German Ministry for the Environment (BMUB):
# BfN Research Project: „Awareness of Urban Nature”

How important is nature in the city for the following aspects?
(Source: Nature Awareness Study 2015, BfN, to be published 01/2016)

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Very important</th>
<th>Important</th>
<th>Unimportant</th>
<th>Not important</th>
<th>No comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>…for the well-being of city inhabitants</td>
<td>72%</td>
<td>23%</td>
<td>4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>…as habitat for animals and plants</td>
<td>68%</td>
<td>26%</td>
<td>5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>…for the townscape</td>
<td>68%</td>
<td>27%</td>
<td>4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>…for cc mitigation and adaptation</td>
<td>62%</td>
<td>29%</td>
<td>6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>…for the city’s prestige</td>
<td>58%</td>
<td>35%</td>
<td>6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>…for property value</td>
<td>41%</td>
<td>42%</td>
<td>12%</td>
<td>2%</td>
<td></td>
</tr>
</tbody>
</table>
Green spaces can support adaptation to climate change

- **Big green spaces** have higher cooling effect than small ones.
- Cooling effect increases with amount of **green volume**.
- Different climatic effects of urban vegetation during **day and night**.
- **Open space system** with large connected open spaces can have slightly higher cooling effect than one with many single small open spaces.
- Network of small open spaces important for **bioclimatic functions**.

Distribution of green volume and maximum cooling effect in the city of Dresden (Source: Mathey et al. 2011)
BfN Research Project: „Ecosystem-Based Approaches “

„Ecosystem-based approaches to climate change adaptation and mitigation – success factors and obstacles encountered“

Collection and analyses of case-studies from Europe and German-speaking countries

- Scientific studies
- Online project database (German only)
- Information broschures
- Guidelines for project managers (German only)

Nature-based Solutions to Climate Change in Urban Areas, Bonn/Germany, 17-19 Nov. 2015, Prof. Dr. Beate Jessel, BfN President
German Water Association Lippe, EU - Interreg IVB-project "Future Cities - urban networks to face climate change“

**Measures undertaken:**
- Restoration of water bodies
- Re-design of sewage infrastructure
- Creation of recreational areas

**Benefits:**
- Flood protection
- Micro-climate improvement
- Habitat restoration and improved ecosystem resilience
- Improved recreational value
- Participation of residents

Picture: Construction site of the Lippeverband – Building the Climate Corridor Kamen
New Ideas for Derelict Land: BfN Project „Urban forests“

Site selection

- Former municipal nursery 3,8 ha (completed)
- Former train station Plagwitz approx. 5 ha (planned)
- City redevelopment area 4,6 ha (completed)

Implementation

Source: (ATKIS-DOP) © Landesvermessungsamt Sachsen 2007

Effects on urban climate

Air temperature summer day Rosenthal Leipzig
23.06., 15:00, cloudless, simulation micro climate modell ENVI-Met

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How do we spread and implement our results?

- TEEB-DE „Ecosystem Services in the City“: chapter on „Good Climate“
  (Launch: May 2016)

- Green Book „Green in the City“: chapter on „Urban Climate Change“
  (German Environment and Building Ministry, 2015)

- Alliance „Municipalities for Biological Diversity“
  (conferences, workshops, newsletter, internet)

- New BfN research project “Green Infrastructure in Urban Areas“ (2015-17)
Day 1: ‘Science’

Presentations on “Nature-based solutions to climate change in urban areas and related multiple benefits”, Evening Lecture and reception

Day 2: ‘Demonstrating good practice / implementation’

Parallel interactive sessions (+ plenum summary), Poster session

Day 3: ‘Nature-based solutions in policy and business for conservation under climate change’

Presentations and final plenary discussion
Thank you for your attention!

Prof. Dr. Beate Jessel,
President of the German Federal Agency for Nature Conservation (BfN)

With contributions from: Jutta Stadler and Alice Schröder (BfN)