

# Introduction to green-blue urban grids

Half of the earth's inhabitants live in cities, and urbanisation is only increasing. The quality of our future, the quality of urban life and the functioning of the city thus depends on the quality with which we shape our cities, restructuring and transforming toward a sustainable city.

Our challenge is to keep our cities and our planet liveable, safe, healthy and attractive throughout this century. Due to climate change, increasing urbanisation and the depletion of fossil fuels, cities will need to undergo a more or less gradual transition from being primarily consumers of food toward producing their own.

One attractive and efficient way to guide this necessary transformation is by developing green-blue urban grids which will mitigate the effects of climate change and the energy and food shortages in urban areas. Our cities need to become more resilient to be able to tackle these challenges, as a lack of resilience will not only lead to a deficiency in technical infrastructural functioning but will also have consequences for a city's social and economic well-being.

Furthermore, green-blue urban planning can offer more room for the development of biodiversity and a healthier, more attractive living environment.



[United Nations 2011]

The challenges are manifold:

- More and more, our cities will need to be able to absorb more rain in shorter time spans and at the same time be able to bridge prolonged periods of drought.
- Higher temperatures due to climate change and the expansion of paved surface area in urban areas result more often in extreme heat.
- Due to human activity there is a global decline in biodiversity.
- The Netherlands is one of the most polluted areas in Europe regarding air quality and particulate matter.
- On a global scale we have not come any closer to finding a solution to food shortages.
- Large cities continue to grow in surface area, and in many countries there is population growth.
- In this century we will need to accomplish the transition from fossil fuels to sustainable resources.



# THE ROLE OF ARCHITECTS AND URBAN PLANNERS: THINK GLOBAL, ACT LOCAL

These issues certainly require substantial transformations. However, many yet untapped opportunities can be found with a detailed approach to these urban issues – solutions which can be very effective when applied conscientiously.

An important task for architects and urban planners is therefore to find attractive ways to integrate these measures in our cities and to assume directive roles in their implementation. In recent years there has been growing interest in more sustainable architecture and urban planning. Green roofs and facades are in fashion; rainwater increasingly remains aboveground. There is an urban agriculture movement, and energy-neutral residential areas are already being realised. This shows that support already exists for new green-blue urban planning. Additionally, the green-blue grids are an excellent way to realise a more circular city and by introducing more recirculation to make the urban metabolism more efficient.

What is still lacking is an overview of the possibilities and a critical and constructive assessment of these measures to ensure that the various possible measures are not counterproductive.



## 1. KNOWLEDGE

One of the goals of this book is to make the recently developed scientific and practical knowledge in the field of climate adaptation and mitigation, heat stress, urban biodiversity, urban agriculture, air quality improvement and decentralised sustainable energy production accessible and applicable for the professionals working in urban development.

This scientific knowledge is translated into practicable measures and their effects offering explanations of how they affect the various challenges, cost indications and spatial implications.

## 2. EXAMPLES

The second goal of this book is to use examples from the Netherlands and abroad to illustrate how the measures can be implemented. This bridges the gaps between science and practice and between technology and design.

## 3. TOOLBOX

The book's third goal is to provide a toolbox to help in the realisation of green-blue urban grids and to illustrate and explain the synergetic potential of the various measures.

What is important now is to afford architects, urban developers, water managers, urban ecologists and everyone else involved in designing towns and cities a greater understanding of the effects, possibilities and interrelations between the various measures for green-blue urban grids, to ensure that those grids are integrated into the urban designs in a manner that is both aesthetic and acceptable to the citizens.

The buffering and purification capacity of green roofs, wetlands, surface water with green banks, and more green urban areas in general, help to improve the urban water system in both quantitative and qualitative terms. More urban water and green urban areas help to increase biodiversity in towns and cities and bind

particulate matter; green surfaces and water surfaces have lower temperatures and by this reduce the risk of heat.

Having more green areas substantially improves the sponge effect of towns and cities. The greater the proportion of green areas, the stronger the buffering capacity: clusters of trees and shrubbery buffer more than lawns alone. The large leaf area means that more water evaporates in wooded parks and presents a greater cooling effect than do grassy areas.

Initial studies already show the effectiveness of more green and more water in urban areas in terms of appeal, biodiversity, heat stress, water retention and improved water quality. Green-blue urban development provides biomass for energy production and presents opportunities for food production within towns and cities. We have only just started to identify and support these possibilities: the integral nature of and synergy between the possible measures and effects has barely been studied.

There is a task here for designers and other parties involved in area development. They need to involve the populace already in the design process so as to increase the acceptance of measures such as water squares and urban wetlands.

Another factor is that green areas and surface water play a very important role in determining the appeal of a town or city and as such influence economic value.



## 4. PROCESS

The fourth objective of this book is to provide the necessary knowledge and design principles for green-blue urban grids to area developers, managers and designers so that these measures can already be considered in the initiation phase and at the beginning of the design phase. For this reason, in addition to listing the measures, attention is paid to defining successful vision development and implementation processes for these intersectoral measures. Giving new form to these processes is perhaps a greater challenge than the development of technical knowledge.

The new measures require collaboration both within and outside a municipality by different disciplines and services that are not familiar with this way of working. Green-blue urban development requires collaboration between urban developers, architects, city ecologists, water experts, and the managers of green and open space. This collaboration must also be accepted and valued by the citizens.

In recent years atelier GROENBLAUW has been commissioned by municipalities, provinces and the Dutch Ministry of Infrastructure and the Environment to work with those involved. Through interdisciplinary climate workshops we have been able to help develop attractive, integrated and widely accepted solutions for various areas (including Hoogetveen Bentinckspark, Culemborg EVA-Lanxmeer, Scheveningen Harbour and others).

To meet the challenges of the future we will need to develop ways in which the various sectors can work together and formalise and institutionalise these forms of collaboration.