TU Delft

LECTURE SERIES

ECOLOGICAL URBANISM

SESSION CHAIR: NICO TILLIE

GREEN CITIES EUROPE

The last of three lectures on Designing Green Cities took place at the Faculty of Architecture and Built Environment at Delft University of Technology on 24 November 2022.

After being welcomed by **dr. ing. Steffen Nijhuis**, research Leader at the department of Urbanism, **dr. ir. Nico Tillie**, researcher Urban Ecology Design at TU Delft introduces the topic of ecological urbanism.

First, he explains the concept of ecology: all organisms are interdependent

and interact with one another and the physical environment. Biodiversity is about genetic, species and biotopes. It's like a Kapla tower: if you take a stone out, it has consequences for the 'tower', the system. Ecological urbanism is about CO2, climate change, (urban) food production, circularity, health, refugees, biodiversity. All these challenges are connected. Ecological urbanism is about creating an adaptive world we can live in.

Tillie states that ecological urbanism should really be the basis for urban planning. That is why it fits so well at TU Delft. Urban planners look at the biosystem of a landscape: the natural or agricultural layer. On top of that lays the city. Why not look at a city as an ecological system, a forest? There are three levels of design interventions: on a system level, a habitat level and a species level. An example of a design intervention on a system level is the Project Future Vision Rotterdam Watercity 2035. In this long-term, comprehensive project, the city council combines good housing, green public space and water transport.

A good example of designing on a habitat level is ecological restoration. Tillie refers to a project in China that aimed to clean the dirty water in a city canal, using nutrients and ecological principles. By putting plants in the canal, as well as a boardwalk, they brought the canal back to life in two ways: the plants cleaned the water and people enjoyed the new, green urban space.

The third level of design interventions is on a species level. For instance, through creating biotopes in urban green spaces by connecting them (through rooftops, parks, gardens, surrounding land). This way you form a connecting landscape within and around the city, ideal for wild life. Naturally, this should take into account the conditions for species, so they have enough places to stay, nest and hide. A good example of urban synergy is the new Dafne Schippersbrug in Utrecht. The design integrates a park, a school and a bridge.

Next speaker is **dr. Marco Roos**, project manager at NCB Naturalis, researcher Urban Biodiversity, Leiden University. His presentation is on the biological system of biodiversity and urban ecology.

Roos starts by noting that 20% of the landscape is formed by cities. So they should be part of the landscape, biodiversity and ecosystem. The quality of the ecosystem depends on the quality of biodiversity. If we want biodiversity in cities, we need to make room for housing for birds, bats, insects, etc.

Biodiversity is a complex concept. It is not a candy shop where you can grab some of this and some of that. It is not one packet of seeds, or a few trees. It is not just about life above ground, and it is certainly not neat. A truly nature-inclusive city is one with messy, wild green spaces everywhere. That will not please everyone.

One of the most important aspects of healthy biodiversity is soil. The quality of the soil reflects the quality of the plants above ground and vice versa. Beneath the soil there is a very distinct animal world (fungi, bacteria, soil animals) and a vast root system, connecting trees and plants. This underground ecosystem responds to changes, danger and (human) interference.

When thinking about urban development to enhance biodiversity, it is important to realise that species in urban environments are and act differently from their counterparts in rural areas. Moreover, good intentions do not always ensure the intended goals. For instance, most seed packets contain many sterile flowers. They look nice, but are of no use to pollinators. Rose explains that spontaneous plant growth works much better. It is possible to control spontaneous processes (succession) through good maintenance management of outdoor spaces. Ecological management of public green spaces incorporates life cycles of fauna, intervenes less, and intervenes differently per location or purpose.

Ideally, this applies to the city as a whole: to all gardens, parks, streets, buildings and rooftops. Street plants actually form an ecological network of microhabitats. Therefore, scale is important to create an ecological network that enhances biodiversity. Realise that a nature-inclusive city takes time. Succession of vegetation vitality takes decades.

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FOREST URBANISM

SESSION CHAIR: RENÉ VAN DER VELDE

GREEN CITIES EUROPE

Prof. Maria Chiara Pastore's presentation (Politecnico di Milano - Department of Architecture and Urban Studies) focuses on Milan's Forestami project, to plant three million trees in this city before 2030.

She begins her speech with alarming figures on how we are using up our planet's resources. Pastore reminds the audience that this year's 'Earth Overshoot Day' fell on 28 July. On that day, we had actually used up all our annual consumption of the earth.

There is a need for immediate action. Worldwide, there are numerous organisations, institutions, projects, initiatives and programmes striving to stop climate change, including by greening cities and planting forests.

One is the Forestami project in Milan, Italy, launched in 2019. It is part of the EU mission of 100 climate-neutral and smart cities by 2030. In Italy, nine cities are participating in this programme. Some of the funding comes from the government. The research for Forestami was done by the Polytechnic University of Milan.

At the start of the project, the city's subsoil was first mapped: soil types, its compaction, the (im)possibilities of planting trees there, the urban climate, watercourses (above and below ground). In addition, existing trees were inventoried, as well as canopy cover. In 2018, this was 16.58%. Potential locations for trees were mapped. In parks, streets, squares and surrounding forests. The results were then linked to focus areas. In these, a selection was made, based on opportunities.

For the project, intensive consultation with the city districts has been and will be held. About their plans and willingness to participate and about longer-term agreements (e.g., maintenance). All on a voluntary basis. Cooperation, education and familiarity with residents have also been sought. For instance, they can adopt and plant trees themselves. Both the city maps and all information about the project are online for all to see. The institute continues to build a database so that the information can be shared with other municipalities and organisations. But also, so that everyone can see the impact of the project, even on a small scale.

The different types of trees come from growers who have grown them from certified seeds. The goal is to achieve canopy coverage of 20%. In 2026, the first monitoring of what the project has achieved so far, including the impact on biodiversity, will be done.

Last speaker is **dr. Wiebke Klemm**, landscape architect and senior policy advisor urban spaces and sustainable living environments at the municipality of The Hague.

Her lecture is about The Hague's efforts to bring more valuable green space into the city and the challenges it faces to do so. One of these is the growing population. General policy is to build new housing in the city itself. The focus is to concentrate them near public transport hubs. The Hague is focusing on three goals: making the city more compact, greener and more sustainable.

Klemm explains the complexity of designing public space in a densely built-up city. Many actors are involved, both within the municipal organisation (departments, administrators) and outside (businesses, citizens). In The Hague, policy documents on the design of different parts of public space are still all separate. There is no integrated approach yet. Partly because of this, when (re)designing public spaces, greenery often comes last, when the budget is almost exhausted. Whereas it should be included at the very beginning, to create public places where people want to be.

There are good developments, such as the memorandum City Trees in The Hague. This is much more about tree canopy coverage instead of just the number of trees. Also, the starting point is 'designing with nature, unless'.

With European funding, The Hague now has a number of projects, which promote greening the city and involve residents. As a successful example, Klemm mentions Cromvlietpark in de neighbourhood Laak. It has become a busy park frequented by many residents. Laak residents and entrepreneurs conceived and built the park. The European Union gave a grant to build a 'water buffer' under the park. This is a European (INTERREG 2-Sea) grant through the Nature Smart Cities project.

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