

Shared habitats in the ecofield

We are living in a world today where we are pushed to reconsider the survival of humanity, because our living environment is threatened by the reduction of natural habitats and the decrease of biodiversity. The Netherlands is exemplary in this discourse as it has been appointed as 'country with the lowest biodiversity of the European Union' (PBL, 2012).

This is caused due to a dichotomous way of thinking. Dutch biodiversity policies are based on the separation of nature and man; natural land and cities; which results in an approach that excludes cities and architecture as possible habitats. Cities are merely designed for humans, the preserved natural domains for species.

Shared habitats: architecture as key-link within ecosystems

By redefining architecture as an abiotic habitat condition, the built environment becomes a suitable living environment for species. Shared Habitats therefore creates an environment where these species can co-exist with humans.

A new strategy is developed for this approach, called the ecofield. The ecofield includes architecture as part of the ecological flows and conditions of the landscape. Architecture becomes a key-link within the cohesion of ecosystems on a large scale. Designing from this ecological perspective will surpass the separation of man and nature, of city and land.

Current ecosystem-strategies: based on dualities

The way we conceive and understand the world determines the way we built our cities and design our buildings. In order to be able to redefine architecture from an ecological perspective, it is needed to understand how terms as 'biodiversity' and 'ecosystems' are conceived in Dutch culture.

According to the ecology philosopher Caroline Merchant (1989, p. 1-3) the conception of our world has a history of the reality being composed by interconnected parts in a coherent whole. This changed during the Scientific Revolution in the sixteenth century when nature was seen as an unpredictable phenomenon that needed to be analyzed, categorized, manipulated and controlled. Humans were conceived as fundamentally different from nature. A mechanical world view appeared and a dichotomy of city and the natural land evolved.

Around 1970 a shift appeared in this mechanical way of thinking due to decreased natural areas, loss of biodiversity and damaged natural conditions. It became an urge on a global scale, resulting in an international convention led by the United Nations Environment Programme (Secretariat of the Convention on Biological Diversity, 2000, p. ii). In 1990, the Dutch government created agreements on biodiversity which resulted in a plan to nationally relink natural areas and to conserve and strengthen ecosystems, now named as Natural Network of the Netherlands (Ministerie van Economische Zaken, n.d.).

Our mechanical approach towards nature gave space to redefine nature as an ecosystem, which implies a more holistic attitude on an all-species-included, shared living on this planet.

The term 'ecosystem' was first defined by Arthur George Tansley (1935) as the relationship between organisms and their environment. More in detail, ecosystems are formed by the interaction between the living organisms and the lifeless environment they inhabit. These organisms, called the biotic factor, include plants, animals, fungi and bacteria, while the lifeless environment, as the abiotic factor, include sediment, water and weather conditions. However, the Natural Network of the Netherlands doesn't include humans as biotic factor, nor architecture as abiotic factor.

We still conceive humans – and their environment – as intrinsically different from other species and their habitat. In addition, the word 'system' – as a set of things working together as parts of a predetermined mechanism – still implies that we are managing nature for human benefit.

New ecofield strategy: architecture and human included

'Shared habitats' changes the concept of 'ecosystem' in a more holistic, interlinked strategy, called the 'ecofield'. The word 'eco' is derived from the Latin word 'oikos', which literally means 'house' (MacDowell, 1989). It defines a certain spatial condition which enables existence, and implies that ecology deals with the space needed for all organisms to have an existence. Therefore the landscape is not only formed by i.a. dunes, forests and meadows,

Essay

but also by city structures. Instead of dividing the landscape into natural land and cities, the landscape can be seen as one spatial continuum where all these landscape typologies are linked.

This perspective relates to the ideas formed by Aristoteles, and later on by Plato, who define the universe in terms of 'a single continuum of existence', containing all living things which were all subjected to the same order (Dummet, 2007, p. 13-14).

From this perspective, all organisms are living in a shared, continuous reality, subjected to the apparent conditions of their environment. In other words; every piece of the landscape can be seen as a habitat, or 'oikos', where every living being and environment is linked.

In this strategy, the word 'system' is replaced by the word 'field', because it introduces the specific, spatial context of a habitat and the apparent relations between these habitats.

The word first appeared as a term in physics and originated by the meaning of "an area of influence" (McMullin, 2002, p. 13). It defines the apparent interactions between conditions within this area. At the same time, 'field' describes a piece of land (Merriam-Webster, n.d.) and therefore 'field' introduces the interactions within a spatial context. Every context is specific to its location and determined by large scale factors as geology, morphology and climate. Species cannot be seen apart from their context, because the specific conditions of that place determines whether they can find a suitable living environment or not.

The ecofield defines the universe in terms of 'a single continuum of existence', though very specific on different locations on the earth's surface. It's the interaction between living beings and their place-specific environment, all functioning together in a shared, continuous landscape.

This ecofield-strategy includes the built environment as abiotic factor, and humans as organisms. It therefore surpasses the division between humans and other species, and between the built environment and the 'natural' land.

Haarlem as ecofield

'Shared habitats' explores how this ecofield-strategy could change the current architectural design approach in order to generate an all-species included architecture. An important starting point is to examine this within our current building culture, which is based on rational, and geometric forms.

The ecofield that stretches from the city center of Haarlem to the sea is a test case for this project. It's marked by eight different landscape typologies, whereby the city structure is – just like the dune forest and the sea – another typology. The differences of the geology, morphology and climate conditions give each landscape a very specific character and different habitat conditions. This enables the design to investigate how these place specific conditions would alter and determine the design.

Walking route crossing habitats

A recreational and contemplative walking route is created from the center to the sea, crossing all landscape typologies. Along this route, eight different and site specific 'nestling spaces' are designed, wherein both humans and other species can find shelter. A nestling space is a place to be located in a sheltered spot.

The architecture of these 'nestling spaces' are conceived and formed as an abiotic habitat condition in order to create this shared habitat wherein species and humans can co-exist.

Apart from this new design attitude with the ecofield-strategy, this project has two main goals. First of all these nestling spaces will stabilize, activate and increase the biodiversity by dispersion of species along the whole ecofield. At the same time the design enables humans to experience these habitats in unique ways along their walks. It will generate awareness about how all habitats are linked, how the city structure is related to the natural landscape and how every being exists through the existence of another being.

Architecture to improve biodiversity

Every landscape typology is inhabited by place specific species. The ones that play a key-role in ecosystems are named 'keystone species'; if you create suitable conditions for this specific organism, it will create a suitable habitat for lots of other species too (National Geographic, n.d.).

The architecture of each nestling space is formed by requisite conditions of these site specific keystone species in order to improve the biodiversity. The conditions will create a stable environment to thrive as a specie and, from there, to disperse along the ecofield. The keystone species are also linked to each other and will have a beneficial

Essay

impact on the habitats of other keystone species. At the same time these created microclimates will attract other species and therefore increase the biodiversity on a larger scale.

Awareness of the ecofield by experience

After defining the spatial conditions for the keystone species in relation to the apparent landscape, the design is refined with spatial needs for humans to experience the species and habitats in unique ways. Like the program of the keystone species, the human program is based on movement and finding shelter. People will physically undergo the ecofield by crossing the landscape and by inhabiting the nestling spaces for a longer period. Each built environment provides the opportunity to stay for the night, but has also an additional program like a tea garden, chapel and small scale library.

Niches in the continuous landscape

The fusion of the conditions of the keystone species, the specific landscape and the human program results in an architecture of niches. Niches along a route through the ecofield which provides shelter for humans and other species. The design creates microclimates on the scale of the landscape, up to the detailed scale of materialization and texture. By treating the nestling spaces as an abiotic factor, the total design is determined by climate conditions (precipitation, temperature, light and shadow, wind direction), soil conditions (soil type, groundwater, humus, acidity) and water conditions (salinity, water depth, wave height). Parallel to that, it influences the biotic factors of the landscape and will create suitable habitat for these species. These aspects mostly influence the orientation, position, size and materialization of the design. Generating different micro climates on different scales.

By defining the design as an abiotic factor, the nestling spaces become part of the specific landscape. Also in the way people are able to experience it. The walking route crosses the buildings, so the walk stays a continuous feature in the design. As a result every space – of both the design and the landscape – flows into the other space. Interior climates, outside climates and in-between climates are constantly alternated along the walking route. The notion that you're constantly part of the landscape is increased by the creation of sight axes and the different eye heights and perspectives on the landscape. Each landscape typology puts different emphasis on the experience of the landscape by different eye heights, enclosures, sight axes, inside-outside climate, openness, light and shadow play and use of materials and textures.

Shared habitats; architecture as a key-link for the coherence in ecosystems

These nestling spaces within the ecofield of Haarlem demonstrate how architecture as an abiotic factor can create suitable living environments for both species and humans. Most of the time architects and urbanists merely take human program into account, whereby plants and animals aren't able to inhabit and find shelter in the built environment.

Purely by approaching architecture from an ecological perspective, we become able to – with a relatively minimal change of the current building culture – create suitable habitats for a diverse range of animal and plant species. The ongoing battle between space needed for humans and the amount of preserved nature (in relation to biodiversity issues) could be surpassed. By merging ecological principles with the architectural discipline, changing our attitude and architectural agenda's, we're able to transform architecture into a key-link within ecosystems on a global scale.

'Shared Habitats' surpasses the division between natural land and the human, built environment. It creates a landscape where all habitats are linked and where species can flourish and co-exist with humans. Inhabiting the continuous ecofield in a shared reality.

Literature

Dijksterhuis, E. (1998). *De mechanisering van het wereldbeeld*. Amsterdam: Amsterdam University Press.

Dummett, E. (2007). *Green space and cosmic order: Le Corbusier's understanding of nature*. Edinburgh: Ph.D University of Edinburgh.

Essay

Lemaire, T. (2008). *Met open zinnen: natuur, landschap, aarde*. Amsterdam: Ambo.

MacDowell, D. (1989). *The Oikos in Athenian Law*. The Classical Quarterly. Volume 39, Issue 1, p. 10-21.

McMullin, E. (2002). *Physics in perspective: The Origins of the Field Concept in Physics*. Basel: Birkhäuser Verlag.

Merchant, C. (1989). *The Death of Nature: Women, Ecology and the Scientific Revolution*. New York: Harper One, 1989.

Merriam-Webster (n.d.). *Field*. Retrieved from: <https://www.merriam-webster.com/dictionary/field>

National Geographic (n.d.). *Keystone Species*. Retrieved from: <https://www.nationalgeographic.org/encyclopedia/keystone-species/>

Oxford Dictionary (n.d.). *System*. Retrieved from: <https://en.oxforddictionaries.com/definition/system>

Oxford Dictionary (n.d.). *Landscape*. Retrieved from: <https://en.oxforddictionaries.com/definition/landscape>

Planbureau voor de Leefomgeving, PBL (2012). *Druk op de biodiversiteit in Nederland is hoogste van EU*. Retrieved from: <http://themasites.pbl.nl/balansvandeleeftomgeving/jaargang-2012/landelijk-gebied/natuurbeleid/biodiversiteit-en-oorzaken-van-verlies-in-europa>

Rijksoverheid Ministerie van Economische Zaken (n.d.). *Natuurnetwerk Nederland*. Retrieved from: <https://www.rijksoverheid.nl/onderwerpen/natuur-en-biodiversiteit/inhoud/natuurnetwerk-nederland>

Secretariat of the Convention on Biological Diversity (2000). *Sustaining life on Earth: How the Convention on Biological Diversity promotes nature and human well-being*. Montreal: Secretariat of the Convention on Biological Diversity.

Secretariat of the Convention on Biological Diversity (n.d.). *Sustaining life on Earth*. Retrieved from: <https://www.cbd.int/convention/guide/default.shtml>

Stanford Encyclopedia of Philosophy (2013). *Scientific Revolutions*. Retrieved from: <https://plato.stanford.edu/entries/scientific-revolutions/>

Tansley, A.G. (1935). *The Use and Abuse of Vegetational Concepts and Terms*. Ecology, Vol. 16, No. 3. (Jul., 1935), pp. 284-307.

Townsend, C., Begon, M., Harper, J. (2010). *Essentials of Ecology*. Oxford: Blackwell Publishing.

Tummers, L., en Tummers-Zuurmond, J. (1997). *Het land in de stad: de stedenbouw van de grote agglomeratie*. Bussum: uitgeverij Toth.