Vital Cities do not exist outside nature

Biodiversity as a prerequisite of life

Last time I wrote this blog I discussed about what we need to consider in planning of vital cities. I concentrated on the economic and socio-cultural aspects of vitality, particularly stressing the role of diversity in regard to urban activities, population, and build environment. I deliberately excluded an essential aspect of vital cities for which I wanted to devote a complete post – namely, ecological vitality. Similarly to economics and social or cultural issues, natural systems require diversity: *biodiversity*, a popular term embraced in many discourses of life today, does not just help sustaining livability of cities – it is a prerequisite for it. Biodiversity means the overall the variety life on Earth. For biodiversity, all forms are important: microbes, insects, fish, mammals, and entire ecosystems such as forests or coral reefs. We see today the result of 4.5 billion years of evolution. UN estimates that one million species are on the threshold of extinction soon, main driver being the human land-use. Unnecessary to say, we are completely dependent on the nature and its current environmental patterns. Without healthy ecosystems emerging from a vast diversity of animals, plants and microorganisms we cannot rely on food, fresh water, or other necessities. Unhealthy ecosystems increase the risk of expansion of zoonotic diseases. What makes these issues difficult to control for human mindset, species ecosystems do not die in a linear manner. If facing stress, the population attempts to adapt to the change for a while, until after a tipping point it drops and perhaps never recovers. Moreover, species ecosystems are interlinked, often in complex ways we do not know. Dissapearing of one species may cause a chain reaction leading to a collapse of many others.

Regarding human settlements the linkage between diversity and life, however, is not always self-evident. The division between built/unbuilt retains as a common fallacy, and I, as an architect, admit being guilty of previously re-enforcing this conceptual mismatch. However, to delve into these problematics of biodiversity, humans and the city, let me share a personal story of coexistence.

City-dweller in the wilderness

Last spring I bought a summer house, a 220-year-old small farm house in fairly original condition. It is in the outskirts of a remote village in the middle of old cultural landscape, and since the buildings has not been in constant use, nature has more or less taken over the yard and surroundings. Consequently, the species diversity is astonishing: instead of a lawn, a meadow of hundreds of different blooming plants and grasses surround the place; garden and fields are crowded by deer, bobcats, foxes, bats, all kinds of domestic reptiles and dozens of birds from eagles, hawks, cranes and ravens to variety of smaller ones that nest right in the garden; there are insects so much that you can hear a loud buzz everywhere throughout the day (and

actually the night too, thanks to a fantastically noisy great green bush-cricket (*Tettigonia viridissima*) I never have encountered before).

The lawn, or a meadow. *Image: © Jenni Partanen*

I am a regular nature-goer, but I usually pick berries and mushrooms in industrial, species-poor tree fields they nowadays call forests. Seeing something in such a natural state made me feel like a visitor (which I still think I was), and it was genuinely hard to perceive a dichotomy of *nature* and *artificial* - I felt there is just nature we (temporally and humbly) borrow for living just like any other species. My non-human neighbors have just as much right to live there as I did (and they were there before me, probably way before anyone of my kind). But as soon as us humans stepped to the backyard, it was evident that we started affecting these ecosystems – making paths, disturbing birds, letting the dog roam around the bushes, and just stomping around. However, I started to wonder whether we could do our best to leave everything as is, and coexist?

Local fauna. *Images: © Jenni Partanen*

We could try that, but it appeared that for humans, it is always more or less about efficiency: in the end, it's about money and benefits we invest, and return or lose. In the natural state, the old, completely overgrown thicket that used to be a plum garden is, in its current state, a paradise for birds and insects. But do we want plums? Even if we decide to do without and make it a reservation for other species, there are other issues.

The 'plum garden'. *Image: © Jenni Partanen*

For the small part of the lot that is forest, it would be easier to just to not go there and leave it as it is – an idyllic shady grove filled with birdsong and napping deer. Plenty of benefits would follow from this decision: currently, 25% of the forest species live on rotten wood – they are actually a good indicator for the overall species diversity. Moreover, 30% of those are endangered due to the current, harsh and often exploitative forest industry. So why not support that?

It is noteworthy that a mindset of equal rights and coexistence implies that we cannot pick and choose who settles, which means also uninvited visitors. An example would be the gigantic, 10 cm long larva of the goat moth (*Cossus cossus)* that consumes surprisingly efficiently living wood, increasing the risk of trees falling on buildings or people. Carpenter ant (*Camponotus herculeanus*) nests very comfortably in deadwood but enters from time-to-time log buildings, making huge disaster to houses. 'Our' forest is their home too, but they may cause remarkable financial damage. After encountering of these two fellows in our backyard (and there might be others!) I still have no solution for this dilemma, but I decided to see how it goes - ecosystems often solve issues, predators come after their prey or plants build up a pest control system of their own.

Nature and cities

This experience made me think about cities a bit differently as well. It appears evident that for cities, nothing is non-nature, either - but as the geographical scale is much bigger, the scale of the problems is manifold. Cities occupy three percentages of the earth, and this share is increasing. Considering that farming occupies 40% or the earth surface, and the role of extensive tree farming, i.e. forest industry, and deforestation in reduction the species diversity is expanding, species diversity in urban areas is far from being irrelevant. It seems evident that we need to consider biodiversity both in cities and elsewhere, however different toolkit is needed for both. The issues concerning species ecosystems inhabiting cities are also qualitatively very different compared to the (nearly) natural state similar to my farm and tiny forest. The urban species have quickly adapted, and evolved to have special requirements regarding their environment, due to the human-induced habitat transformation and fragmentation, variety of environmental stressors, human aesthetic and other preferences, and historical and socioeconomic factors. Typically, urban species tolerate well excessive drought, heat, and light, and they are competitive.

We need special attitude and skills to plan the ecosystems in general, and urban ecosystems in particular. It is possible to embrace two partly overlapping and complementary perspectives to ecosystems. However, they stress very different aspects of the systems. Ecosystem services -view emphasize the benefits gained from nature for humans, such as food, heath, water, mental recovery, and so on. This (political) discourse is often entangled with sustainability thresholds, control over the systems, embracing an anthropocentric view. Complexity or ecosystem view, considers world as highly interlinked dynamic system; delicate networks of networks where a smallest part can have a great impact on the whole, while extensive disturbance of the entire structure might go unnoticed and absorbed into the systems' overall dynamics. We cannot control such complexity, just guide and enable its spontaneous operation. This viewpoint might better enable the *ecocentric* view, a stance where species and their networks have intrinsic value as such; and eventually accepting the idea that we are just one species among others and not detached from nature.

From egocentric to ecocentric humankind?

In addition to attitude change, it will be necessary to see the urban nature as a whole. Considering that 'green' in cities has value as such not only to us but other species too, we could extend the planning of ecosystems and green networks from what is neat and entertaining for us to other kinds of green environments. Functionally, parks and recreation areas are inseparable from the ecosystems inhabiting road shoulders, industrial fallow areas and scrubs on empty lots. Aesthetically it might be possible to see the unconventional beauty in this variance in greenery, similarly to how we are able to value in the patina of ruins, in old, rugged industrial buildings; or the 'concrete brutalism' in architecture.

Green is not always planned. Image source: Fshog.com (Creative Commons) https://fshog.com/free-photos/p/232/abandoned-factory-in-hanover

In the end, it is necessary to note that in designing complex systems things often go wrong due to unpredictable factors obvious in hindsight. In the Finnish city of Turku, supporting biodiversity was taken seriously, and city decided to plant a meadow with dozens of different flowers instead of a monoculture lawn (A-M. Naakka, IS, 23.8.2022). The idea was to contribute to global degeneration of bees and other polluting insects by providing them food. However, it appeared that the northern insects were unable to utilize the nectar of the selected non-native species of flowers – despite their large and colorful inflorescences apparently attracting them. Such errors are common when encountering complex systems, and they require more adaptive and considerate attitude: by trial and error -mode it is possible to do small trials, monitor what went wrong, and fix it for the next time.

Small steps lead to big leaps

While being aware of the almost utopistic picture I draw here, the direction of my thoughts is scientifically well established and further elaborated among many urban ecologists, philosophers, and other scholars, arguing that our superior stance often is harming us. The reason is clear - human neurobiology is not

suitable for embracing spatially and temporally separated, uncertain consequences of our action, and our understanding of statistical dependencies is biased in favor of personal judgements based on bounded rationality. Although a sudden leap towards any level of species equality is improbable in the short term, a new perspective of how we understand and treat nature is likely necessary for the survival or (human) life on Earth. Currently, I am quite optimistic though, seeing younger generations going vegan and being involved in citizen activism to make a change. Perhaps some of those baby-steps could be possible for us middle-aged people as well?

Literature:

Aaltola, E. (2022). Affective Animal Ethics: Reflective Empathy, Attention and Knowledge Sub Specie Aeternitatis. In *Human/Animal Relationships in Transformation* (pp. 67-89). Palgrave Macmillan, Cham.

Naess, A. (1988). Deep Ecology and Ultimate Premises. *Ecologist*, *18*, 128-31.

United Nations (2022): Biodiversity - our strongest natural defense against climate change. (online https://www.un.org/en/climatechange/science/climate-issues/biodiversity)

Newspaper article (in Finnish)

Naakka, A-M. (2022): Turussa kylvettiin hehtaari-kaupalla kukkia ihmisten iloksi – hyönteis-tutkija näkee ison ongelman. Iltasanomat, 23.8.2022 (https://www.is.fi/turun-seutu/art-2000009030484.html)