

# Time for a biodiversity turn in sustainability science

*For a society to emerge in which people make money through restoration rather than through the destruction of nature, closer dialogue between sustainability science and socially diverse biodiversity conservation is needed.*

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Accelerating biodiversity loss is one of the major threats to a sustainable future of our planet. *Sustainable Development Goals (SDGs)*<sup>1</sup> 14 and 15 that address the degradation of oceanic and terrestrial ecosystems have experienced a long-term negative trend, and thus the biodiversity crisis, along with climate change, is one of the major unresolved issues of sustainable development (UN 2019). Indeed, none of the 2020 *Aichi Biodiversity Targets* of the *Convention on Biological Diversity (CBD)* has been met<sup>2</sup>, and animal populations have declined by two thirds within only a few decades<sup>3</sup>. The vast majority of protected areas across Europe are in poor condition (EEA 2020), and according to Swiss Re “a fifth of

countries worldwide [are] at risk from ecosystem collapse as biodiversity declines”<sup>4</sup>.

However, while biodiversity loss is widely acknowledged as an impediment to sustainable development, so far there have been relatively few solution-oriented collaborations between experts from nature conservation and sustainability science. For instance, developing new relationships with nature (in the sense of “ecological webs”) is neither recognised as an entry point nor as a lever of societal transformation (UN 2019). With the evolving focus of sustainability science from problem diagnosis to societal transformation we must foster ecological innovations as much as technoscientific and social<sup>5</sup> ones. All land, and especially intensively used areas, must regain ecological qualities through biodiversity-friendly land use practices and ecological restoration<sup>6</sup>. We need ecological innovations in urban as much as in rural areas, and in affluent countries as much as in developing ones, and we need to involve a much broader segment of society in responsible and competent ecological practices.

In this article we argue that a dialogue between sustainability science and nature conservation would benefit both sides. Nature conservation could learn from sustain-

ability science how to complement its focus on protection with socially engaging transition strategies toward biodiverse land-use systems and societies. Sustainability science, in turn, would benefit from a better integration of ecological knowledge to judge synergies and trade-offs between the promotion of biodiversity, climate adaptation and development, and more generally to envision nature-based societies in the Anthropocene. We present ongoing projects in Switzerland in the context of the *Swiss Biodiversity Strategy* and its action plan to highlight the potential of such collaborations. In a first paragraph, we demonstrate how experiences and methodologies from sustainability science can help to enable transformation processes towards biodiverse urban areas. In the second part, we argue that the growing importance of relational values in biodiversity conservation can be harnessed to broaden the coalition of actors for biodiversity conservation.

## Scaling-up urban transformation for biodiversity

City planning is confronted with two opposing trends: densification and greening. To prevent urban sprawl, construction is now largely confined to existing urban

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1 [www.un.org/sustainabledevelopment/sustainable-development-goals](http://www.un.org/sustainabledevelopment/sustainable-development-goals)

2 [www.cbd.int/gbo5](http://www.cbd.int/gbo5)

3 <https://livingplanet.panda.org>

4 [www.swissre.com/media/news-releases/nr-20200923-biodiversity-and-ecosystems-services.html](http://www.swissre.com/media/news-releases/nr-20200923-biodiversity-and-ecosystems-services.html)

5 Including a reform of the economic system and changing cultural practices and values.

6 The UN Decade on Ecosystem Restoration will start in 2021: [www.decadeonrestoration.org](http://www.decadeonrestoration.org).

spaces. This, however, leads to further sealing of soils and the loss of green spaces. At the same time, urban green is increasingly recognized as habitat for animals and plants, as supplier of ecosystem services (e.g., climate regulation, air purification), health services and recreational space. In order to balance these opposing trends,

To this end, a process-based methodology ensured the active involvement of relevant actors and their needs so that win-win solutions could be worked out together. We focused on four concrete cases. The cases represented different life cycle phases (planning, construction, maintenance) and types of ownership (public

### **Recognizing diverse relations with nature across society**

In recent years, relational values of nature have increasingly gained recognition in biodiversity conservation as a complement to intrinsic and instrumental values (Chan et al. 2016). Relational values are not inherent in living beings or ecological entities, but rather derive from our relationships with them. They relate to virtues such as stewardship, responsibility and care and resonate with a recognition that socioecological contexts matter for social agency in processes of societal transformation (Kueffer et al. 2019, UN 2019). Relational values help us to better link nature conservation to our everyday life by highlighting our personal, social, cultural, and spiritual relationships with nature.

At a pragmatic level, this allows to foster biodiversity-friendly practices in different socioeconomic sectors ("mainstreaming biodiversity") – for instance, the promotion of biodiversity in urban planning and building legislation as described above (Kueffer et al. 2020). At a more fundamental level, relational values help us to engage a broader segment of society with biodiversity. The German *Bundesamt für Naturschutz (BfN)*, for instance, has focused increasingly on the intersections of nature conservation with other societal issues, such as poverty or migration, to develop strategies that reach out to culturally diverse groups, thereby reducing socioeconomic biases in the awareness of biodiversity, and bringing the issue of environmental justice to the fore in nature conservation<sup>10</sup>. In a forthcoming study, supported by the Swiss *Federal Office for the Environment (FOEN)*, we<sup>11</sup> have worked towards strategies that support a more inclusive, socially diverse, and multicultural biodiversity conservation movement (Kueffer et al., unpublished data). Based on a survey of neglected social actors in Swiss nature conservation, we organised workshops that explored ways to establish >

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ecology and construction must be brought together through the involvement of all relevant stakeholders (Di Giulio 2016). Such multi-stakeholder processes aimed at transforming a complex social system are a typical challenge for sustainability science.

We<sup>7</sup> have, over the last few years, worked on new processes that enable urban transformations towards biodiverse cities in Switzerland. Based on a scoping symposium<sup>8</sup> we identified hurdles and opportunities for biodiversity promotion across the whole life cycle from planning to construction and maintenance. The follow-up project *Co-creating urban biodiversity (Siedlungsnatur gemeinsam gestalten<sup>9</sup>)* tested concrete ways to foster such transformation processes.

As a result of these processes, we recognized that guidelines and recommendations are not sufficient means to motivate decision-makers. Rather, positive, practical experience in dealing with the new is needed to break down mental barriers and enable behavioural change (Vihalemm 2015). Specifically, the perception and valuation of biodiversity and its contribution to quality of life must change among the decision-makers and stakeholders who shape cities; and their competence to promote biodiversity must be developed.

green spaces, housing estates, office buildings). Together with the relevant decision-makers we defined the specific objectives for their sites and organisations by analysing the initial situation and the needs of the various stakeholders. We then developed a concept for promoting biodiversity and quality of life in outdoor spaces as a starting point of a longer-term process: our partners should eventually be enabled to advance the biodiversity-promotion measures on their own. The aim of such a co-creation process is to anchor biodiversity and its services permanently in the decision-making processes of the various organisations. The results gained from the four case studies will be used to upscale similar processes in the different linguistic and cultural areas of Switzerland through creation of regional networks that enable innovation across the country. The results will also show how biodiversity can contribute to the sustainable development of cities and municipalities (*SDG 11*). To this end, we can count on the support of four federal offices: Swiss Federal Office for the Environment (FOEN), Federal Office for Spatial Development (ARE), Federal Office for Housing (BWO), and Federal Office of Public Health (FOPH).

<sup>7</sup> Katrin Hauser and Manuela Di Giulio, together with Danièle Martinoli, *Swiss Biodiversity Forum*.

<sup>8</sup> Organised in April 2018 in Bern by the *Swiss Biodiversity Forum*, KPM Center for Public Management at the University of Bern and Natur Umwelt Wissen GmbH.

<sup>9</sup> [www.siedlungsnatur.ch](http://www.siedlungsnatur.ch)

<sup>10</sup> [www.bfn.de/themen/gesellschaft/soziale-fragen.html](http://www.bfn.de/themen/gesellschaft/soziale-fragen.html)

<sup>11</sup> Christoph Kueffer and Caroline Wiedmer, together with Ariane Tanner at Franklin University Switzerland in Lugano and Jasmin Joshi at ILF, OST Ostschweizer Fachhochschule in Rapperswil, among others.

new alliances for biodiversity. We used narrative methodologies to facilitate experience-based workshop interactions and created digital stories in the form of videos to illustrate how knowledge about ecological innovations can be made more accessible. One workshop focused on strengthening interactions between the “traditional” green industry and the nature garden movement. It showed that many traditional gardeners care greatly about biodiversity. Rather than a divide we found commonalities in the form of shared challenges, for instance, the need to defend the value of the artisanry of good gardening. A second workshop with entrepreneurs explored why so few start-up companies focus on biodiversity-related products and services. One challenge here is that biodiversity is often perceived to be a free good, and consequently there is no

### Aus dem saguf-Netzwerk

Fachhochschulen (FHs) haben großes Potenzial, durch transdisziplinäre Forschung gesellschaftliche Innovationen und Transformationsprozesse anzustoßen und zu begleiten. Angeregt durch die saguf und eine Artikelserie in GAIA<sup>a</sup>, laden die Akademien der Wissenschaften Schweiz mit einer neuen Publikation dazu ein, Handlungsspielräume wahrzunehmen und FHs in der an den Nachhaltigkeitszielen ausgerichteten Forschung breit zu verankern.

Akademien der Wissenschaften Schweiz. 2020. *Forschung für gesellschaftliche Innovationen an Fachhochschulen (FHs) – Potenziale, Rahmenbedingungen, Handlungsfelder*. Swiss Academies Communication 15/12. Bern: Akademien der Wissenschaften Schweiz. <https://doi.org/10.5281/zenodo.4090403>.

<sup>a</sup> <https://doi.org/10.14512/gaia.26.2.23>, <https://doi.org/10.14512/gaia.27.4.5>, <https://doi.org/10.14512/gaia.27.4.6>, <https://doi.org/10.14512/gaia.27.2.6>

The stories of our workshop participants illustrated how even in a country like Switzerland – where the majority of the population lives in cities and works in offices – living with nature matters greatly.<sup>12</sup> The workshops also highlighted that issues of nature conservation are intrinsic to the

tween a young rural and urban population – for ecological innovations by engaging a broader segment of society in design thinking about sustainable and biodiverse futures. The *Swiss Academic Society for Environmental Research and Ecology* (saguf) has – for almost 50 years now – been carrying both ecology and environmental research in its name. This complementarity is needed to make the 21<sup>th</sup> century an era of ecology: sustainability must be rooted in ecology, and ecology rooted in society.

The projects presented in this article were amongst others funded through the Swiss Federal Office for the Environment (FOEN) based on the action plan of the *Swiss Biodiversity Strategy*.

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market; another one is that conservationists sometimes oppose entrepreneurship. A third workshop focused on why the well-documented health benefits of nature are only poorly harnessed in the health sector. Medicine in our society, so our finding, is primarily oriented towards fixing illness rather than preventing it by strengthening self-healing abilities. Finally, we spent a weekend with a diverse group of young people ranging from climate activists and permaculture farmers to winemakers and hunters to discuss how to build bridges between a young urban and a young rural population. An important conclusion was that there is a great willingness to experiment with new ways of living, but that it is often difficult to survive economically with nature-based products and services.

broader questions underlying the transition to a post-growth, nature-based and care-oriented economy. In a sustainable society people must be able to make money in ways that restore rather than destroy nature as a by-product<sup>13</sup>.

### Conclusions

Building bridges between sustainability science and biodiversity will be central to reach a sustainable society. We presented projects that explored the role of biodiversity in professional fields that are traditionally considered to be unrelated to nature conservation: architecture and urban planning, commercial horticulture, entrepreneurship and medicine. Our examples illustrate how we can unleash creativity and form new partnerships – for instance, be-

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<sup>12</sup> The UN increasingly recognizes concepts such as *Harmony with Nature*, *Mother Earth*, or *Rights of Nature* that represent a non-anthropocentric understanding of our relationship with nature: [www.harmonywithnatureun.org](http://www.harmonywithnatureun.org).

<sup>13</sup> While at present even government subsidies mostly promote practices that lead to further destruction of biodiversity: [www.wsl.ch/de/2020/08/ueber-160-subventionen-schaden-der-biodiversitaet-in-der-schweiz.html](http://www.wsl.ch/de/2020/08/ueber-160-subventionen-schaden-der-biodiversitaet-in-der-schweiz.html).