Universities as frontrunners in the effort towards green and biodiverse cities?

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ABSTRACT

How can policy ambitions regarding the preservation and expansion of urban green space be turned into concrete realisations in cities? We argue that universities could play a key role here. Universities often not only have large campuses with green spaces in core urban areas, they are also centers of knowledge and education that can point to the urgency of global sustainability challenges and can leverage their expertise to contribute to solutions. To illustrate this position, we present the lessons learned from the development and implementation of the Biodiversity Action Plan at Ghent University, Belgium. Four years after the adoption of the plan, the target of a net increase in biodiversity by 2030 is still far off. But we are learning that living lab-like initiatives that combine research, education and campus operation are potentially effective arenas to turn the extensive knowledge present in academic institutions into action.

It is increasingly recognized that urban greenspaces are of key importance for biodiversity conservation and human wellbeing (CBD, 2022; European Commission 2022a, 2022b). As a consequence, a growing number of municipalities have put conservation, restoration and nature-friendly management of urban green areas high on their priority list. In reality, however, the actual realization of greenspace ambitions is lagging, not the least due to the fierce competition with other priorities, such as housing and infrastructure (Back and Collins, 2022). Achieving ambitious targets for urban greening, such as the 3–30–300 goal (Konijnendijk, 2022), is challenging and therefore all urban actors – public and private - will have to be motivated to contribute to the greening effort (cf. Gerits et al., 2021). We argue that universities could play a key role in this respect. There are more than 30,000 universities globally (www.webometrics.info/en/distribution_by_country) and many of them have large campuses in urban areas that can host a significant number of species and ecosystems, often with a high conservation value (Liu et al., 2021). Besides the space argument, universities are knowledge and education centres well aware of the urgency of global sustainability challenges *and* have the expertise

to contribute to solutions, including the creation of good, healthy living and working environments and the halting of biodiversity loss.

However, to take up this leading role new partnerships need to be established that go beyond the classical modus operandi at universities with typically limited interaction between research and education on the one hand and campus operation on the other. Lately, the concept of campuses as living labs for sustainability, i.e. interdisciplinary arenas where research, education and campus operation jointly tackle sustainability challenges, is gaining traction (Verhoef and Bossert, 2019). It remains nevertheless challenging to transform these theoretical concepts into working institutional arrangements that actually generate impact. Here we present the lessons learned from the development and implementation of the Biodiversity Action Plan at Ghent University, Belgium (UGent) to inspire and help other universities that also want to actively engage in the conservation and restoration of urban greenspaces and biodiversity.

UGent is one of the major Belgian universities with eleven faculties, more than 49,000 students and 15,000 staff members (www.ugent.be). The university is distributed over 23 campuses and owns c. 250 ha of

	Helpful for the ambition	Harmful for the ambition
Internal origin *(within the organisation)*	Strengths -Bottom-up developed BAP by a trans- and interdisciplinary biodiversity expert group of academics and university management staff, capitalizing on the capacity present within the university; -BAP approved by the universities' Board of Directors turning it into an official policy document; -Implementation of the BAP overseen by a biodiversity expert group.	Weaknesses -The bottom-up biodiversity expert group is not incorporated in the universities' organisational chart making its mandate and responsibilities uncertain; -Despite the BAP's approval by the universities' Board of Directors, the BAP and its consequences are not actively communicated nor enforced by the universities' top management, leading to conflicts with other university ambitions in general, and development projects in particular; -The activities of the biodiversity expert group rely to a large extent on the voluntary commitment of its members which may jeopardize its continuity in the long-run.
External origin *(environment surrounding the organisation)*	Opportunities -Growing societal awareness of the tight links between human well-being and urban greenspaces and biodiversity; -Increasing recognition of urban biodiversity targets in high-level policies and legal documents (e.g. post-2020 CBD, EU Biodiversity strategy to 2030) -Growing interest among citizens, including students and university employees, to help initiating and implementing greening measures, reinforced by the results of realized greening projects.	Threats -The university continues to grow, resulting in increasing needs for research, teaching and housing facilities and infrastructure that can potentially jeopardize the BAP implementation; -Increasing university budget constraints may shift the universities' priorities away from achieving the BAP targets.

Fig. 1. SWOT (Strengths, Weaknesses, Opportunities, and Threats)-analysis of the development and implementation of a Biodiversity Action Plan (BAP) at Ghent University.

land. The 14 campuses located in or at the edge of the city comprise 142 ha and have c. 50% non-paved areas including lawns, extensively managed grasslands, and woodlands, representing c. 15% of the city centre's public and private green areas. Furthermore, on the two campuses that have been most intensively studied in terms of biodiversity (Ledeganck 3.6 ha and Sterre 23.3 ha), no less than 1130 and 1532 different species have been entered into a citizen-science biodiversity database, including many rare ones (www.waarnemingen.be). One of UGent's strategic ambitions is to become a leader in the transition towards a more sustainable society. This ambition is among others realised through the establishment of a Green Office in 2015 that offers an arena where researchers, students and operational staff can work together to implement the institution's sustainability policy. In 2019, the imminent loss of biodiverse green spaces for several building projects on UGent city campuses triggered researchers from different faculties to call for an UGent-vision on greenspaces and biodiversity. The UGent management endorsed the need for such a Biodiversity Action Plan and the UGent Green Office brought together a mixed expert group of researchers and management staff who volunteered to develop it. The resulting plan www.ugent.be/nl/univgent/missie/duurzaamheidsbeleid/klimaat-plan/biodiversiteitsplan.htm) is organized around five strategic pillars and 19 actions and has the ultimate ambition to realize a net gain in green spaces and biodiversity on UGent campuses by 2030. The plan became an official UGent policy document after approval by the Board of Directors in 2020. Since then, the expert group – being the authors of this article - has taken the initiative to oversee the implementation of the plan and has gradually evolved as the first-point-of-contact for biodiversity policy and management on UGent campuses. Note that a successful implementation of UGent's Biodiversity Action Plan will also

significantly contribute to the cities' ambitions with respect to green and biodiversity (De Bruycker, 2020), given the extent and biodiversity value of UGent's campuses mentioned above.

Although the above-described process may seem smooth and straightforward, several hiccups and hurdles were encountered. Fig. 1 gives an overview of important strengths and weaknesses, next to the opportunities and threats. The latter two mainly determine the potential momentum for a university biodiversity policy, whereas the first two can be tackled within the organisation. The main lessons learned from the UGent-trajectory since 2019 are that living lab-like initiatives to help materialize institutes' sustainable development ambitions have a lot of potential as they can effectively serve as an arena to transform the extensive knowledge present in academic institutes into action. However, it is key that (1) bottom-up initiated processes are – right from the start of the process - fully endorsed by the universities' top management, (2) the management realizes and accepts the consequences such a plan may have for other policy domains, such as infrastructure and mobility, (3) the management gives a clear mandate to the involved experts and integrates them in the universities' organisational chart to clarify for what the expert group needs to be consulted, at which stage of the planning process this should be done, and whether their input will be binding or not. The latter conditions were not always met at UGent, being a potential source of frustration and conflict. We also advise to put in place procedures to assure a consistent functioning of the expert group over time. The expert group typically relies on the voluntary commitment of its members and significant membership turnover is not unlikely. Therefore, a good documentation of the group's modus operandi is warranted to ensure a consistent biodiversity policy in the long run.

Four years after the creation of the Biodiversity Action Plan and the establishment of a transdisciplinary expert group to implement and monitor it, the 2030 net biodiversity gain-goal at UGent is still far off. However, this should not prevent other institutes from taking similar initiatives. At UGent, the plan and the dynamics around it has put campus biodiversity on the agenda and has generated new institutional arrangements between research, education, and operation that will generate significant positive impacts on the city's biodiversity in the future.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References

Back, P., Collins, A.M., 2022. Negotiating the green obstacle course: ranking priorities and problems for municipal green infrastructure implementation. Urban For. Urban Green. 67, 127436 https://doi.org/10.1016/j.ufug.2021.127436.

CBD, 2022. Target 12, Kunming-Montreal Global Biodiversity Framework, 19 December 2022, CBD/COP/DEC/15/4 (https://www.cbd.int/doc/decisions/cop-15/cop-15-dec-04-en.pdf).

De Bruycker (2020) De tuin van alle Gentenaars Beleidsnota openbaar groen 2020–2025. https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwiLouewzPn8AhXa8LsIHYLKDhcQFnoECAkQAQ&url=https%3A%2F%2Fstad.gent%2Fsites%2Fdefault%2Ffiles%2Fmedia%2Fdocuments%2FBeleidsnota%2520Openbaar%2520Groen%25202020–2025.pdf&usg=AOvVaw0tv0CsYkg9oKRmAOq6g3le.

European Commission, 2022a. Para 2.2.8., EU Biodiversity Strategy for 2030 (https://environment.ec.europa.eu/strategy/biodiversity-strategy-2030_en).

European Commission, 2022b. Article 6, Proposal for a Regulation of the European Parliament and of the Council on nature restoration, COM(2022) 304 final, 2022/0195 (COD), 22 June 2022 (https://environment.ec.europa.eu/publications/nature-restoration-law_en).

Gerits, F., Messely, L., Reubens, B., Verheyen, K., 2021. A social–ecological framework and toolbox to help strengthening functional agrobiodiversity-supported ecosystem services at the landscape scale. Ambio 50, 360–374. https://doi.org/10.1007/s13280-020-01382-0.

Konijnendijk, C.E.J., 2022. Evidence-based guidelines for greener, healthier, more resilient neighbourhoods: introducing the 3–30–300 rule. J. For. Res. https://doi.org/10.1007/s11676-022-01523-z.

Liu, J., Zhao, Y., Si, X., Feng, G., Slik, F., Zhang, J., 2021. University campuses as valuable resources for urban biodiversity research and conservation. Urban For. Urban Green. 64, 127255 https://doi.org/10.1016/j.ufug.2021.127255.

Verhoef, L., Bossert, M. The University Campus as a Living Lab for Sustainability. A Practioner's Guide.