

Stepping stone cities? : exploring urban greening and gardening as a viable contribution to global biodiversity conservation

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SUMMARY

“Order is what exists before you start arranging things.”

Marty Rubin

Are urban greening and gardening viable approaches to help addressing global biodiversity loss? In this dissertation I explore biodiversity conservation as a practice with many faces, zooming in from a global conservation perspective to one particular strategy: urban greening and gardening and its potential role for conservation in a rapidly changing world. Not so much an ecological exploration of this question is provided, but one that is mainly based on the cultural perspectives that constitute conservation paradigms on the one side, and human practices and discourses in the field of urban greening and gardening (for conservation) at the other side.

Change is a fundamental characteristic of the global ecosystem and contemporary human practices have accelerated global change in ways that fundamentally transform the global landscape. Crutzen and Stoermer, for example, call the new geological era that emerges from recent and contemporary human impact on the planet the '*Anthropocene*' (Crutzen & Stoermer, 2000). The Anthropocene is a geological era that is characterised by human domination on the planet and it will be described (by potential future generations) for its long lasting remains: e.g. terrestrial- and oceanic pollution, an altered global climate, changed and fragmented ecosystems. Currently, the global ecosystem is strongly impacted by processes of large scale and vast urbanisation: the growing global human population is increasingly seeking life and a living in cities and smaller cities have been turning into megalopolises fast during the last decades. Urban lifestyles, imports and exports of services, resources and wastes are increasingly putting more pressure on the already weakened global ecosystems and on biodiversity (Grimm, N. et al., 2008).

One of the main challenges in the Anthropocene era is to maintain a viable biosphere that is grounded in biological diversity: the variety of living entities on the planet and their complex web of functional relations. Stated by earth system scientists, the urgency of taking action to protect biodiversity from a runaway decline is high (MEA, 2005; Steffen et al., 2005; CBD, 2011; Rolston, 2012; Pimm et al., 2014). However, due to the complexity of the problem it is difficult to set clear priorities and to define undebated pathways (Miller et al., 2011; Minter & Miller, 2011; Robinson, 2011). The early conservation movement mainly aimed to protect species and ecosystems. The contemporary conservation movement has broadened its scope and includes the diversity of life, of ecosystems (Takacs, 1996) and of ecosystem services (Costanza, 1997; TEEB, 2009, 2011; Costanza et al., 2014). In this dissertation the field of biodiversity conservation is approached as a patchwork of distinctive yet partly overlapping practices and discourses with many ambiguities and tensions: between stakes and stakeholders, between scale levels, between conservation approaches and conservation priorities and between their underlying basic assumptions and (shifting) cultural perspectives. In general there are two levels on which biodiversity conservation will be explored in this thesis: Firstly, I will look into conservation perspectives on the global level. Secondly, I will explore how the

perspectives on the global level link up with ideas and practices that are ongoing on the local citizen level.

The practical and theoretical question for the next decades is: *can biodiversity conservation be reconciled with a rapidly changing, urbanising world?* Such a research ambition requires a variety of approaches and sites. As said before, biodiversity conservation is a patchwork of various practices, means and ends. More importantly, conservation practices are *human* practices: practices defined by basic assumptions of people about the world (*worldviews*) and basic assumptions about the right strategies (*management styles*) to solve problems that occur in the world. As such I define 'conservation practice' *in a cultural context: as a patchwork of practical expression(s)* (Latour, 1988, 2005; Robinson, 2011) *of a variety of cultural perspectives* (Verweij et al., 2006). A shift towards including urban areas in the conservation patchwork implies a societal distribution of conservation practice: where conservation has been basically driven by (funded) research and (political and non-political) governance, in an urban context it may have to become carried by the everyday life actions and daily practices of civil society as well. Is civil society ready to contribute to conservation in that way? Including urban areas and citizens in the conservation patchwork may contribute to halting global biodiversity loss, but it will most probably also be surrounded by new (socio-cultural) complexities and challenges.

In order to better understand the (socio-cultural) complexities in the conservation field and to explore viable approaches for conserving biodiversity for the future, it is important to gain a better insight into the basic assumptions and worldviews underlying the patchwork of conservation practices. It may help address and understand synergies and tensions between different existing conservation approaches and styles. Such insights may help to understand why global targets for halting the loss of biodiversity haven't been met yet. Also it may help to explore the question whether including urban ecosystems as a site for conservation may be a viable approach and an effective cultural practice for maintaining a thriving biosphere.

The methodological framework of this dissertation is based on *Integrated Sustainability Assessment* (ISA): fitting the complexity and plural character of the topic a set of qualitative and (semi-)quantitative methods are employed to address the main questions. In order to assess conservation as a patchwork of cultural practices grounded in a patchwork of cultural discourses I chose to use the *Perspectives Method* (Offermans, 2012) based on *Cultural Theory* (Thompson et al., 1990; Thompson, 1997; Mamadouh, 1999; Verweij, et al., 2006) as the basis for the key-analytical tool for this dissertation research. The Perspectives Method (Offermans, 2012) has earlier proven to be a useful tool in Integrated Sustainability Assessments (Asselt et al., 1995; Rotmans & De Vries, 1997; Valkering et al., 2006; Valkering, 2009; Offermans, 2012). It has been applied before to

analyse discourses in water management (Valkering, 2009; Valkering et al., 2009; Offermans, 2012), climate change governance (Verweij, et al., 2006), and uncertainties concerning health, energy, biochemical cycles, and land- and water use (Rotmans & De Vries, 1997).

Limitations to Cultural theory have been articulated well by Astrid Offermans (Offermans, 2012). One important limitation that is addressed in this dissertation is the empirical problem of distinguishing people according to theoretical dimensions. It is argued that it is not the grid-group based 'boxes' of the theory that are most interesting to learn from, but the combinations, dynamics and functional relations between the plurality of existing dominant and marginal perspectives: no 'culture' on any scale level functions well without a diverse array of worldviews and management styles to address internal and external problems (Erez & Gati, 2004). An analogy of the value of cultural diversity can be drawn with ecological diversity: diverse ecosystems are resilient ecosystems (McCann, 2000; Gunderson & Holling, 2002; Folke et al., 2004; Bottrell, 2009; Rees, 2010; MacDougall et al., 2013). The question about the 'value of cultural diversity' for 'biodiversity' is central in my exploration of the patchwork of conservation practices and underlying discourses.

After delineating background concepts and the methodological framework (Part I), Part II of the dissertation starts with the conceptual mapping of a variety of contemporary conservation approaches and practices (CHAPTER 4). A content analysis of documents presenting the approaches gives insight into the cultural perspectives underlying these conservation practices (CHAPTER 5). CHAPTER 6 presents an analysis of the Cultural Perspectives represented by scenario-storylines of two significant global scenario studies: the IPCC scenarios and the Millennium Ecosystem Assessment scenarios. It is evaluated what these storylines and their underlying assumptions mean for the future of global biodiversity and its conservation. Then, I continue towards exploring the cultural perspectives represented in the oldest and largest conservation organisation IUCN (CHAPTER 7).

In Part III I explore the rather novel approach of *urban based conservation*. Urban based conservation can be seen as a form of '*reconciliation ecology*' (Rosenzweig, 2003; Kellert et al., 2008; Mitchell & Mueller, 2009; Beatley, 2011; Francis & Lorimer, 2011; Tidball, 2012). Reconciliation ecology aims to bridge the nature-culture divide in conservation thinking by focusing on the greening of cities for biodiversity and for a sustainably living planet (Beatley, 2011). After a theoretical study of the literature on urban sustainability (CHAPTER 8) and urban greening (CHAPTER 9) I explore the viability of the urban based conservation approach by assessing the outlook of Dutch citizens and of international experts on urban greening, represented by contemporary greening trends and gardening practices and designs. Based on the literature study (CHAPTER 8 and 9), empirical fieldwork in front-yards in Maastricht and Phoenix (Arizona) (CHAPTER 10 and 11) and surveys (CHAPTER 12) two frameworks are proposed: one for conceptually discuss-

ing benefits for biodiversity in urban greening projects: the *Biodiversity Benefits Framework*, and one for assessing ecological and cultural contributions to biodiversity delivered in domestic gardens and stimulating a societal dialogue about biodiversity and sustainability in and beyond urban areas: the *BIMBY framework*. The combined results of the various assessments lead to six qualitative Cultural Perspectives based storylines for future biodiversity conservation in an urbanised world (CHAPTER 13).

In Part IV the main findings of the research are presented and discussed and future research questions are identified.

The main conclusions drawn from the results of this dissertation are:

Urban based conservation may become a viable approach to address global biodiversity loss in the near future. Yet, it is only a potential and there are some difficulties to address before urban based conservation can become viable for biodiversity:

- Until now, urban based conservation seems to be largely driven by academic and institutional elite forces. It hasn't yet trickled down to the core of the conservation regime and the public.
- Urban based conservation is still a largely unintentional process in society: urban greening and gardening are unguided by critical discussions on what are sustainable and desirable outcomes for biodiversity.
- There is a knowledge gap in civil society when it comes to linking urban greening and gardening practices to biodiversity conservation concerns. This can be attributed to the lack of well-functioning frameworks and markers to discuss urban based conservation and its potential and limits.

To overcome these hurdles, some points of departure can become leading:

- Traditional conservation organisations can start playing an important role with regards to increase awareness about the potential of urban areas for biodiversity, closing the knowledge gap, and increasing eco-literacy in (urban) society.
- There is a diversity of academic *and* societal motivations for urban greening, there is a great variety of practical options for urban greening and gardening, and these have something in them that may be attractive to all sorts of perspectives.
- The Biodiversity Benefits framework and the BIMBY framework can become tools for increasing and structuring a societal discussion about urban based conservation.
- Marginal perspectives can be emphasised as a potential source of critical reflection on the status quo of society, a source of creative innovation and of novel ideas for urban greening and gardening for biodiversity.

Concluding, it can be said that cities may become important 'hubs' for local and global biodiversity in an urbanising world. Urban based conservation offers a great potential for increasing the quantity and quality of local *and* global green infrastructures. Equally important: citizen creativity and engagement offers a wide range of additional strategies, tools and practices to the conservation field: urban greening and gardening practices have many forms and features and are limited only by the limits of the human creative potential.

Some caution should also be considered: urban based conservation can never replace the efforts undertaken to protect the few wild areas still left on the Earth. However, in the end *Stepping Stone Cities* may become important hubs in a global network of eco-cultural creativity that enables a sustainable future for biodiversity and life on earth.