



Edible Green Infrastructure or Edible Landscapes?: A Case for Co-stewardship in Multispecies Commons

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Abstract

Making cities sustainable will require fundamental changes, including to how we conceptualize and interact with urban infrastructures and landscapes. The concept of edible green infrastructure has emerged from the larger discourse around green infrastructure and nature-based solutions, which reframes ecosystems and natural processes as functional elements of the structures supporting urban life. Yet despite the widespread appeal of re-conceptualizing nature as infrastructure, this approach suffers from two critical flaws that threaten to undermine its long-term viability: 1) it reduces more-than-human life to the status of resource or tool for human exploitation, failing to account for interdependency in ecological systems, and is thus inherently unsustainable; 2) infrastructure is typically not convivial (in the sense of Ivan Illich), rendering a long-term transition to autonomous, participatory management by residents technically and socially unfeasible. Based on this critique, this paper argues for rethinking infrastructure as landscape that can be cared for through stewardship by its inhabitants. Edible landscapes are shown to lend themselves particularly well, as existing practices such as beekeeping already contain elements of stewardship that can easily be re-conceptualized as a collaborative, more-than-human practice: co-stewardship of urban multispecies commons.

Keywords

Sustainability, urban planning, commoning, food system, stewardship, beekeeping

1 Introduction

Cities are facing unprecedented challenges in the pursuit of becoming truly sustainable. This includes a radical transformation of consumption and production systems, including how we grow and eat food (Schröder et al. 2019). Questions of ethical consumption and quality food thus necessarily include urban food production. Recent years have seen a strong increase in scholarship on urban agriculture, ranging from theoretical work rooted in Marxism that demonstrates its potential to fight ecological destruction and alienation resulting from the metabolic rift (McClintock 2010) to applied research examining land use trajectories in shrinking cities for assessing the potential of using urban agriculture in sustainability transformations (Oda et al. 2018). However, urban popula-

tion density has traditionally forced cities to rely on food production outside of urban areas to feed residents. In the context of sustainability and climate adaptation research, urban food production systems have thus usually occupied a niche as a subset of scholarship interested in urban greening. Moreover, while researchers have argued that urban residents' support of environmental policies is influenced by what nature contact they have access to (Dunn et al. 2006), access to community gardens and thus opportunities for urban residents to re-connect with food production remain far more elusive than access to public green spaces. This may well be about to change: following the lockdown policies enacted by cities around the world in the course of the 2020 COVID pandemic, urban food gardens are attracting renewed interest from scholars, with some arguing that enabling broad access in the form of edible infrastructure could reduce the future risk for new pandemics while improving local food security (Sardeshpande et al., forthcoming).

2 Edible infrastructure and its roots in green infrastructure

Edible infrastructure has emerged as a subset of a larger discourse since the 1990s around urban green space, green infrastructure and so-called nature-based solutions that has reframed ecosystems and natural processes as vital and highly functional elements of the structures supporting urban life (Russo et al. 2017). Following fundamental ecological research in the 1970s and 1980s that saw the idea of the city as a space separate from and outside of nature be overturned in favor of cities as possessing unique ecologies and habitats, researchers gathered broad evidence that nature in the city is indeed crucial in supporting human wellbeing (Matsuoka and Kaplan 2008). This included the wide range of so-called ecosystem services, from the production of oxygen to air and water filtration, temperature regulation and the generation of comfortable microclimates. Efforts to translate this evidence into urban policies and increased urban greening, particularly against the background of the emerging climate crisis, led to the term of green infrastructure — an attempt to demonstrate that parks and other green spaces were indeed as vital as roads, sewers and electricity and thus deserving of similar amounts of investment. The concept of edible infrastructure proposed to make green infrastructure even more appealing by providing fresh food as one of the necessities for human life and wellbeing. Indeed, extending the benefits of private and community gardens to the neighborhood or public in retrospect appears an obvious next step. Nevertheless, the idea has yet to be widely implemented. Reasons for this likely include increased maintenance costs and issues around management and ownership that resemble classic issues around commons: who gets to harvest fruit trees, who is supposed to take care of rotting fallen fruit?

3 Pitfalls of “infrastructure”

The issues around edible infrastructure are not unique, but can be traced to conceptualizing the natural processes involved in these human-nature relationships as simply supporting urban life from below, as the word infrastructure implies. Specifically, infrastructure suffers from two critical flaws that undermine long term viability: 1) it reduces more-than-human life to the status of resource or tool for human exploitation, failing to account for interdependency in ecological systems, and is

thus inherently unsustainable; 2) infrastructure is typically not (Illich 1973), rendering a long-term transition to autonomous, participatory management by residents technically and socially unfeasible.

The first flaw is most easily demonstrated through a look at the history of vegetation management in cities and its inherent contradictions. Plants even more so than animals are seldom understood as possessing agency, despite their well-documented abilities to shape their immediate surroundings. This leads to trees being planted and then cut down when they fail to grow because plans did not account for their needs in regard to water, uncompacted soil or root space, or when they grow too well and threaten power lines or pavement substrate. Indeed, many street trees cannot provide the ecosystem services they are expected to provide, because overzealous pruning leaves them stunted and unable to produce large quantities of oxygen or shade and thus thermal comfort. Beyond the failure to account for agency and autonomy of living beings, recent advances in the field of microbiome and public health (Flies et al. 2018) as well as multispecies sustainability (Rupprecht et al. 2020) suggest that an infrastructure approach lacks the systemic perspective required to properly account for the interdependency in ecological systems. Put simply, human wellbeing depends on more-than-human wellbeing, a dimension the reductionism inherent in an infrastructure perspective is ill-equipped to address.

The second flaw becomes most visible when examining the case of infrastructure in shrinking cities with declining budgets. Research on Japanese examples of such cities reveals that their infrastructure requires massive financial resources to pay for ongoing maintenance (Rupprecht 2017). Due to demographic trends and shrinking population, however, public budgets are in decline, leaving cities to choose between managing mounting deficits, abandoning infrastructure and forgoing its benefits, and finding alternative approaches to maintenance. Against this background, participative management and maintenance, in particular of public green spaces, has in recent years attracted considerable attention. Yet work examining residents' preferences for participatory management identifies that residents fundamentally understand infrastructure as something they are neither responsible for nor equipped to maintain, both financially and technically (Rupprecht 2017). Infrastructure is thus not convivial in the sense of Ivan Illich (1973): it is commissioned by the state, built by experts using complex machinery and specialized technical knowledge, and requires large investment. Even disregarding the many issues around participatory decision-making in public infrastructure construction and the reliance of local administrations on commercial contractors, infrastructure is thus the very opposite of a convivial tool that fosters residents' autonomy. Moreover, attempts to shift the burden of providing public services to residents in the context of ongoing neoliberal privatization and austerity measures have left residents weary of calls for participatory initiatives. This represents only one more factor making the long-term, widespread shift to participatory management of infrastructure highly unlikely to succeed.

4 Rethinking infrastructure as stewardship and commoning

Alternatives that address these flaws exist. Traditional ecological knowledge relying on stewardship of surrounding systems is today informing practitioners and scholars seeking to develop new (or bring back old) forms of commoning. A look at the design principles for successful commons by Elinor Ostrom, reformulated from the perspective of a commoner, highlights points of contrast between the way residents view infrastructure and the way commoners view commons:

1. As a commoner I clearly understand which resources I need to care for and with whom I share this responsibility. Commons resources are those that we create together, that we maintain as gifts of nature or whose use has been guaranteed to everyone.
2. We use the commons resources that we create, care for and maintain. We use the means (time, space, technology, and quantity of a resource) that are available in a given context. As commoner, I am satisfied that there is a fair relationship between my contributions and the benefits I receive.
3. We enter into or modify our own rules and commitments, and every commoner can participate in this process. Our commitments serve to create, maintain, and preserve the commons to satisfy our needs. (Bollier and Helfrich 2015:84)

As a result, commoning represents a way to gain autonomy from state and markets, but on self-devised terms rather than as a result of austerity-driven abandonment. However, commoning is a lived, drawn-out process that entails ongoing learning and cultivation of an identity of stewardship and commoning (Bollier and Helfrich 2015). Transitioning from infrastructure to commons thus requires time. As much praise as initiatives for green and edible infrastructure receive, there is a real danger that with every project, infrastructure-oriented mindsets that may complicate and hinder transitions to stewardship and commoning are being reinforced. Resources that should go to communities and capacity building are instead siphoned off by corporations, cementing long-term dependence on external skills and input. In the context of food, this means edible infrastructure may be unable to deliver on the promise of re-integrating food production into residents' daily lives.

5 Co-stewarding multispecies commons

While commoning and stewardship are highly promising ways to address the technical and social alienation of residents created by infrastructure, recent scholarship has questioned traditional role distributions in commons (Metzger 2015): if animals and plants are at the center of these ecological systems, why are they conceptualized as resources instead of collaborators in the process of commoning?

Recent scholarship is arguing for multispecies and more-than-human perspectives that acknowledge the agency of animals, plants, microbes and other life (Kirksey and Helmreich 2010; Locke and Muenster 2015). Taking on board these conceptual advances decenters the role of humans, suggesting instead to understand ourselves as co-stewards in multispecies commons. Given recent microbiome-related advances in our understanding of how deeply humans are entangled with their food systems (Lorimer 2016), edible landscapes offer countless opportunities for becoming co-stewards beyond the boundaries of human bodies. The landscape perspective draws attention to the fact that

living beings inhabit shared, overlapping lifeworlds, rejecting the way infrastructure demotes more-than-human being to support layers undergirding human societies. Even if one is to eventually eat them, following Marder (2013), engaging with living beings in the food system by acknowledging their agency and collaborating to care for a landscape in which more-than-human needs are met appears to be a more ethical way of encounter than simply devouring them. One example useful to illustrate this is the way some Japanese honeybee keepers see bees not as livestock to be brought under complete human control and maximize production. As the Japanese honeybee seeks out nesting opportunities and quickly abandons unsuitable locations, beekeepers seeking to attract bees not only place hives featuring diverse designs but also plant nectar and pollen providing flowers, many insisting that the bees can teach valuable lessons about the ecosystem.

How engage in multispecies co-stewardship remains an open question, but some promising strategies exist. First, as Woelfle-Erskine (2019) points out, this is not a question for Indigenous theories and practices, which already incorporate more-than-human sensitivities and dynamics. Learning from Indigenous science is thus always a good place to start, not only when on unceded territories. A central element includes exploring ways of representing more-than-human voices and interests through the inclusion of multispecies stakeholders, whether in the form of role-playing in negotiations or more formal ways (Thomas 2015). Second, it requires a re-thinking of roles and responsibilities traditionally implied in the concept of stewardship. Co-stewardship will likely have to rely on relinquishing the notion of controlling natural processes and more-than-human agencies. Similar to the principles of multispecies sustainability (Rupprecht et al. 2020), ideas borrowed from cybernetics about engaging with complexity and respecting the operational autonomy of more-than-human co-stewards appear crucial. To return to the example of Japanese honeybees, co-stewardship might entail forgoing the act of domestication expressed in the full human control of bee reproduction cycles, or gently modifying the landscape by planting diverse flowers as sources of nectar and pollen. Unlike placing hives in the midst of industrial monocultures, bees thereby retain their choice of where and how to feed, opening up the possibility for a drawn-out process of learning and observation, trial and error. Finally, and drawing again upon multispecies sustainability and cybernetics, stewardship always includes a notion of anticipatory thinking (Rupprecht et al. 2020). Co-stewardship might thus seek to combine the diverging anticipatory abilities of involved species for the benefit of all.

6 Conclusion

The multiple ongoing crises have rightfully resulted in calls to address the many challenges through systematic and fundamental changes in the way urban landscapes are organized. Infrastructure interventions are appealing because they promise widespread and systemic impact. However, as argued in this paper, infrastructures risks to embrace the idea of reducing more-than-human beings to resources and tools — logic that lies at the heart of capitalism and anthropocentrism fueling the very crises to be addressed. Moreover, infrastructure is not convivial and thus relies on continued state and expert maintenance, threatening its long-term viability. Co-stewardship of multispecies

commons provides an alternative that suggests edible landscapes, rather than edible infrastructure, as spaces attentive to the ways human lives and well-being are entangled and interdependent with more-than-human lives and well-being through food production and consumption.

These thoughts raise several ethical questions to be considered by future research. The first is directly derived from existing stakeholder representation: who gets to sit at the table, and whose voices are heard? Does the tree get to stand (Starik 1995) for its microbial, insect and avian inhabitants, themselves entangled in complex relations of interdependence? Who can speak for more-than-humans as a human representative? Are notions of citizenship and other concepts with historic and cultural specificity helpful in identifying and solving dilemmas? How much ecological understanding is sufficient to justify action, or inaction? In what ways might the fluid gradient of socio-ecological concerns be weighed without falling prey to category errors? And finally, what translations might connect multispecies worlds with human constructs such as markets and states, and if such translations exist, when should they be rejected?

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