Edible urban commons for resilient neighbourhoods in light of the pandemic

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Keywords
Urban commons, Food security, Green infrastructure, Disaster response, Climate change

Abstract
Edible urban commons can aid recovery from the pandemic-induced crises, and build urban resilience to future disruptions.

The Covid-19 pandemic has precipitated a global food crisis, not for sheer lack of food, but from disruptions in supply chains and farm and trade activities (Torero, 2020). Short-term food shortages were fuelled by panic buying and restricted supply owing to stringent lockdown measures (UN, 2020), resulting in food wastage, and volatile prices from demand-supply feedbacks (Harris, 2020). Even as food relief is being extended to those in need, in the near future, malnourishment will be on the rise. Food relief is restricted logistically to staple grains and processed products (Vermeulen et al., 2020), and although it is a temporary measure, many may continue to rely on such food in the wake of pandemic-induced poverty (Haas, 2020). In the medium term, the economic slowdown resulting from the lockdown has left a large chunk of the world's population without income and at high risk of being food insecure (Reuters, 2020). Nutritional security is likely to be compromised as fresh produce and protein become expensive due to their perishable nature coupled with wastage and high demand, and therefore less easily available to the unemployed and vulnerable (El Bilali et al., 2019). As global grain reserves continue to cushion the shock (FAO, 2020), it is evident that the food crisis is an issue of uneven access and distribution of food, particularly in urban areas, which are the hotbed of both the infection and the hunger crisis (SSHAP, 2020). There is an urgent need of applying social-ecological resilience thinking to urban food systems (i.e. feed everybody equitably, provide livelihoods, and avoid environmental degradation) (Hodbod & Eakin, 2015). This includes carefully considering how the pandemic impacts local communities across the Global North and Global South as well as different urban densities, from the capacity for disaster response to social security infrastructures and down to the feasibility of physical distancing measures.

We propose the use of edible urban commons to alleviate the impacts of the pandemic and build more resilience into food systems (Ng, 2020). Industrial food production can achieve long-term systemic efficiency and resilience, but may compromise regional self-sufficiency (Kummu et al., 2020), and in the event of disruption, can fail disastrously (Kevany, 2020). We advocate devolution and diversification through edible urban commons to improve access to food. An edible urban common is a unit of an edible green infrastructure (Russo & Cirella, 2019) which includes any common space, natural or modified, within city and peri-urban limits, that contains naturally growing edible plants and mushrooms. These spaces can be "co-owned and/or co-governed by its users and/or communities according to their own rules and norms" (Scharf et al., 2019) or freely accessible to passersby (Colinas et al., 2019). Examples include community gardens (Figs. 1 and 2), jointly cared for edible verge gardens or public fruit trees found even in market economy dominated cities where communally held land is sparse, but also public spaces owned and maintained by the local community (Bingham-Hall, 2016). Edible urban common projects are emerging worldwide (Table 1). The lockdown period in several countries has seen a rise in popularity of home gardens to provide fresh food (Sofo & Sofo, 2020). However, many people live without access to a private garden or public parks and greens spaces (Wolch et al., 2014), placing a higher lockdown burden on underprivileged communities. Edible commons could provide those in need with affordable access to nutritious fruits, fungi, and vegetables, which will be otherwise unavailable due to prohibitive prices (Harris, 2020) or in subsidised or relief food packages (Vermeulen et al., 2020). With sanitary and distancing measures in place, and staggering the number of users at any given point, edible urban commons would likely remain viable under pandemic conditions.

Specifically, edible urban commons will reduce the dependence on large-scale agriculture and supply chains transporting food across long distances, by introducing a measure of self-sufficiency, even among landless residents. Edible urban commons will help localise and diversify food systems along the lines of smallholder agroforestry, offering alternative sources of nutrients in times of unforeseen stress or shock (Sioen et al., 2017). The introduction of nutritious food to alleviate under-and malnourishment will be part of the health response to the pandemic (Moodie et al., 2013). Various wild and underutilised edible species are rich in micronutrients, resistant to climate extremes, and require little input for growth (Mabhaudhi et al., 2017). In the long run, the use of such species will not only help maintain important genetic resources for the future, but also host wildlife such as frugivores and insects that coexist with these species (Champness et al., 2019). Such measures also promise preventive effects against future pandemics. Researchers suggest that growing poverty and the loss of livelihoods, coupled with reduced enforcement, may drive people to illegal

Fig. 1. Community garden conceptual design for retrofitting shrinking Japanese cities with multispecies edible commons (Design: AOI Landscape Design, Concept: Christoph Rupprecht, Aoi Yoshida, Lihua Cui).

Fig. 2. Community garden in Amsterdam (Picture: Alessio Russo).

bushmeat hunting (Briggs, 2020), and increased habitat loss due to forest clearance for subsistence agriculture (Gardner, 2020). Edible urban commons can be instrumental in educating city dwellers about local food, and thereby reduce the dependence on food imports from unsustainable farming (Rohr et al., 2019) (commercial and subsistence, plant and animal) involving deforestation and hunting. Consequently, reduced intensity of interaction between wildlife and humans at forest interfaces may reduce the risk of zoonotic transmission. Thus, edible urban commons integrate a number of benefits centred on the food–animal–human–environment nexus (Ahmed et al., 2019) (Fig. 3).

Besides improvements on food, health, and wildlife systems, edible urban commons will synergize with other measures to improve urban residents' wellbeing. Firstly, they extend the range of benefits of urban commons such as providing avenues for cultural and recreational activities, and as a therapeutic space (Elands et al., 2019; Engemann et al., 2019). For example, opportunities for co-governance of commons may be incentivised by their food and nutritional value (Sardeshpande & Shackleton, 2020). Edible commons could thereby tackle multiple socio-environmental justice issues, improving access to health benefits while empowering residents as landscape stewards (McLain et al., 2012). Finally, such commons can be expected to enhance climate adaptation efforts similar to other green spaces by regulating ecosystem services such as carbon and water sequestration and heat and flood attenuation (Dobbs et al., 2014; Wang et al., 2014). As we have argued here, edible urban commons can be potent tools to address food-related challenges of current and future zoonotic disease outbreaks. Past pandemics spurred cities to provide infrastructure now taken for granted (Constable, 2020) - urban life without edible commons, too, may be hard to imagine once they have become part of everyday life.

Table 1
Worldwide edible commons projects.

Project	Location	Description/benefits	References
Incredible edible	Todmorden, UK	The community grow edible plants for everyone to share. They also run a wide range of events such as art installations and agriculture show that help strengthen the local community.	https://www.incredible-edible-todmorden.co.uk/
R-URBAN	Colombes, France	The project proposes the creation of a resilient network of spaces including community gardens, educational and cultural spaces and devices for energy production, composting and rainwater recycling.	http://r-urban.net/en/sample-page/Petrescu et al. (2020)
Food Forest	Milan, Italy	The project aims to create a place where people can learn the use in the kitchen of products that derive from 10,000 m^2 of forest with 2000 plants including fruit trees and vegetables. The intent is to make their products free for all with guided experiential and didactic paths.	wownature.eu/areewow/parco-nord-milano/
ParckFarm	Brussels, Belgium	A space that allows residents to come together to grow fruit and vegetables in the public realm. The project includes art installations, agricultural performances, workshops and community gardens.	https://architectureau.com/articles/parckfarm/
The Free Farm Stand	San Francisco, USA	The project encourages community growth and involvement. Volunteers distribute free food from neighbourhood gardens, various farmer's markets, community gardens, public and private fruit trees.	https://freefarmst and.org/about/
Informal community gardens	Hangzhou, China	An informal community gardening phenomenon which provides social interaction and healthy food benefits.	He and Zhu (2018)
The Metta Garden	Colombo, Sri Lanka	A registered organic certified urban garden which shares seeds and plants with the community. It is also a training institute for growing of organic food.	https://www.iucn.org/news/commission-environmental-economic-and-social-policy/201807/creating-urban-garden-all-colombo-sri-lanka
Powerline Community Gardens	Nagoya, Japan	The community enjoys social interaction and growing vegetable, fruit and flowers on land underneath a power line, where an agreement with the power utility provides long-term stability.	Rupprecht and Byrne (2017)
Urban food forest at Browns Mill	Atlanta, USA	The project is converting an abandoned farm close to the city centre into a food forest following the principles of agroforestry, providing fruits, nuts and vegetables as well as educational programs and walking trails.	https://www.conservationfund.org/projects/food-forest-at-browns-mill
Seseragi community garden	Hino, Japan	The project collects organic waste from 200 households for growing organic vegetables, features a no-commitment membership system and provides educational programs for nearby nursery schools.	https://www.namagomi-heraso.com/seseragi-farm/
Organic Market Garden	Auckland, Aotearoa NZ	The project combines multiple aspects by featuring a public garden catering to both humans and pollinators, as well as teaching and food hubs in inner city Auckland.	https://www.fortheloveofbees.co.nz/omg
Edible School project	Berlin, Germany	A school garden and neighbouring wild site where agricultural and wild food species respectively are grown and harvested for use and education at the school.	https://cdf-oberschule.de/essbare-schule/ Fischer et al. (2019)
Growing the City	Victoria, Canada	A municipality-run programme that includes capacity building towards food-producing urban commons including boulevard and community gardens.	Lavallée-Picard (2018)
eThekwini Agro Ecology Unit	Durban, South Africa	A municipality department that trains interested residents in permaculture, and assists with establishment of community gardens on very small to semi- commercial scale, including land and social agreements, material and equipment inputs, and market linkages.	http://www.durban.gov.za/City_Services/AgroEcology/Pages/default.aspx Sardeshpande and Shackleton (2020)

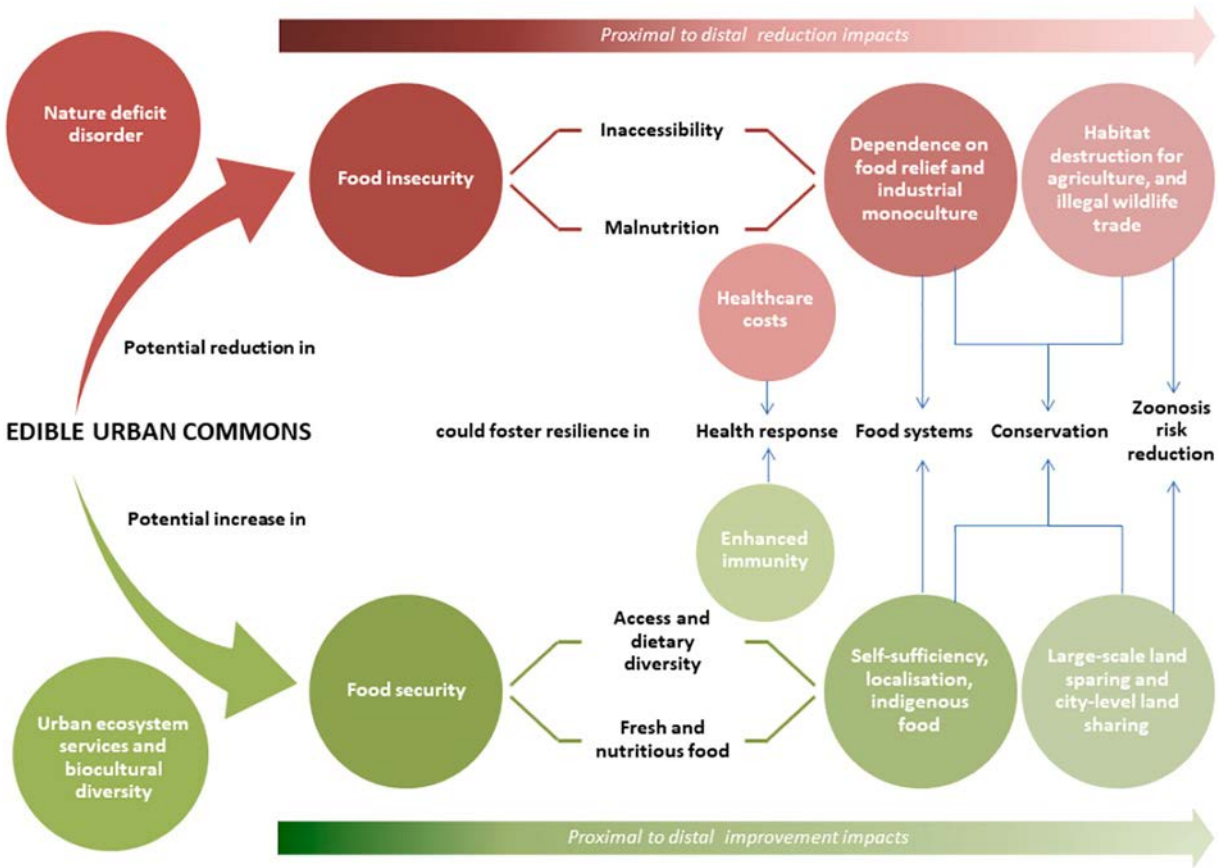

Fig. 3. Conceptual diagram for the role of edible urban commons in building resilient neighbourhoods during pandemics.

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