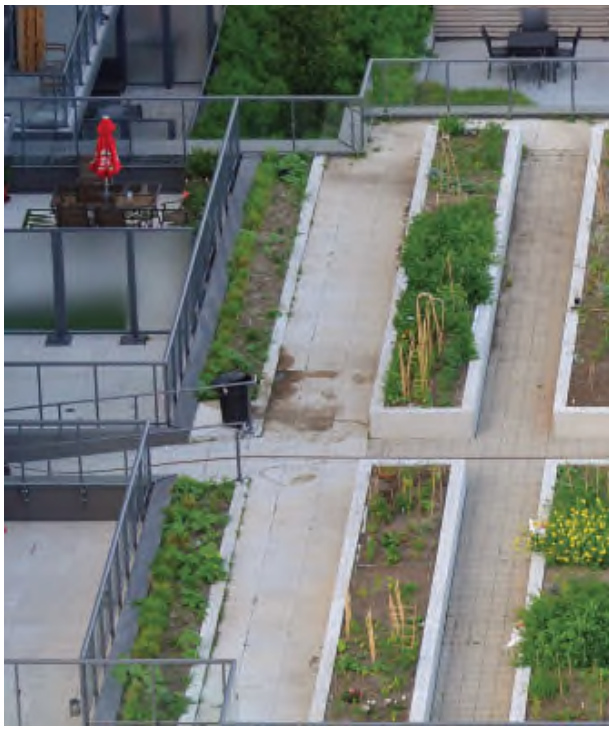
PATRICK MINARDI, GEORGIA POSNO, LIAT MARGOLIS

STACKED LIVING, SHARED GROWING

Rooftop agriculture and the social enterprise of natural capital



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VIVRE EN COMMUN ET CULTIVER SON JARDIN
Les toits cultivables et l'entreprise sociale du capital naturel

AS TORONTO CONTINUES to grow vertically, the city faces a pressing challenge: how to balance the quality of life and environmental resilience in dense high-rise living. One solution gaining traction is rooftop agriculture – not just as a method of food production, but as a new paradigm of green infrastructure that prioritizes human connection and social capital alongside ecological benefits.

The Missing Piece in Toronto's Green Infrastructure

Despite the City of Toronto's Green Roof By-law and Eco-Roof Incentive Program, the role of rooftop agriculture in Toronto's green infrastructure network remains under-acknowledged. This is partly due to the multi-departmental approach to policymaking, where different branches address interconnected issues such as climate action, building regulations and community development. As a result, rooftop agriculture is often not formally measured, regulated or prioritized in planning documents – reflecting a broader need for coordination across city divisions.

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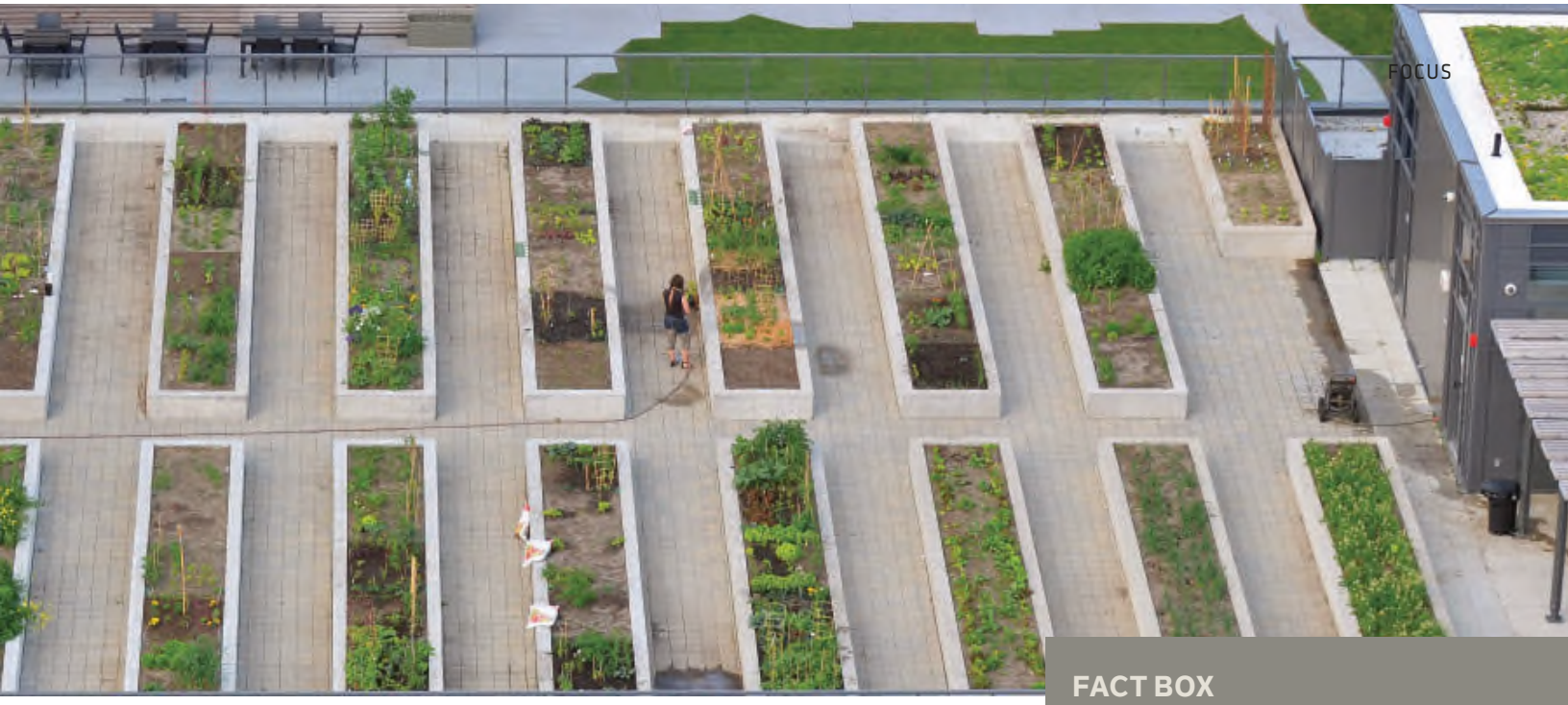
There is also a conceptual distinction between green roofs and rooftop agriculture. While some green roofs include social amenity spaces, their primary value within the context of sustainability lies in their environmental benefits – specifically stormwater management, urban cooling and providing habitat for pollinators. Agricultural rooftops are social and operational by nature with interactive growing spaces requiring human maintenance, often tied to community functions. Growing vegetables is permitted under the City's green roof bylaw, but these roofs are not recognized unless they are first constructed using conventional green roof construction assemblies (root barriers, drainage boards and filter cloths). Of the nearly 1,000 green roofs built since 2009, only one – at Toronto Metropolitan University's (TMU) Daphne Cockwell Health Sciences Complex – was designed specifically for food production under the green roof by-law.

This reveals a larger flaw in how green infrastructure is currently evaluated: the overemphasis on environmental metrics while ignoring the equally critical social pillar of sustainability with respect to their aesthetic and cultural relevancy to good city building. Communities are not moved solely by the measured success of green infrastructure; they are driven by how spaces can make them feel and improve their wellbeing. In contrast, rooftop

1 EVOLV ROOFTOP GARDEN PLOTS (2021). **2,3** ONE PARK PLACE ROOFTOP GARDEN PLOTS (2015).
PHOTOS 1 THE DANIELS CORPORATION, HOFFMAN HAYES
2 HOFFMAN HAYES, NICOLA BETTS **3** HOFFMAN HAYES



agriculture reintroduces a value for nature through social engagement.

Rooftop Agriculture as a Social Amenity

Toronto's rooftop agriculture has evolved over the past two decades, supporting a wide range of uses including gardens connected to restaurants, educational facilities and non-profits serving community groups. Despite their differences, all these spaces have one major commonality - they are not profit-driven. Instead, their motivations speak to community wellbeing, education and circularity, reflecting a commitment to social and environmental objectives over financial gain.

One of the latest rooftop agricultural typologies appearing in the City is on residential condominiums where developers provide rooftop garden plots for residents. These plots – typically constructed as raised concrete planter boxes – are more akin to a rooftop community garden, where participants are assigned a specified plot for the growing season and are responsible for managing these plots with their fellow neighbours.

Dense vertical urban living often leads to a disconnect from nature and overall isolation, with residents sharing a building but not forming a community. The engagement required for the residential garden plots fosters stronger emotional ties to the space and deeper social bonds among residents. In contrast to traditional green roofs, rooftop food gardens can foster a sense of collective stewardship and social wellbeing.

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FACT BOX

Key Challenges:

- Despite Toronto's green roof programs, food-growing rooftops remain overlooked; of the 1,000 green roofs built since 2009, only one purpose-built food producing roof was constructed under the green roof bylaw while more than 40 others have not been tracked.
- Building-integrated food production falls between the cracks of siloed city departments and requires a comprehensive approach.
- Toronto's development pipeline expects over 500 new high-rise towers in the next six years – a major opportunity for scaling up rooftop agriculture, particularly in the residential industry.

Design Opportunities:

- Rooftop agriculture introduces a value for nature through social engagement which in turn improvers the building's upkeep through a shared sense of ownership and care.
- Architects need to determine early in the design process the infrastructure and design considerations necessary to support food growing and community programming.
- Various financial models can be developed to support the staffing of urban agricultural expertise, including an initial investment by the developer after which costs are shared by the building's residents.

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Daniels Corporation: A Case Study in Socially Driven Design

The Daniels Corporation has fostered a reputation for embedding rooftop agriculture into the social fabric of their residential developments. Since 2009, Daniels has heavily invested in urban agriculture, incorporating what they consider to be rooftop community food gardens into 21 of their residential buildings, with a high concentration of these in Regent Park developments.

The long-term success of the rooftop gardens depends heavily on the culture of the building community which can fluctuate over time. To ensure these gardens thrive, Daniels partners with Hoffmann Hayes, a consultancy specializing in community-based urban agriculture and the long-term sustainability of urban agriculture projects. This collaboration ensures that residents receive guidance on gardening practices, seasonal planting and community programming. Daniels' model involves an initial two-year investment in garden infrastructure and programming, after which costs are absorbed by the building's residential association and oftentimes the gardeners through plot fees.

According to feedback from Adam Molson, a vice president of Daniels Corporation Rental Communities and Sustainability Department, the driving force behind these roofs is not environmental such as stormwater management or biodiversity – it's the cultivation of social capital that is woven into their company's identity. Even if the rooftop garden plots conformed to the technical specifications of the City of Toronto's Green Roof By-law – which their current assembly does not – this would still not be the primary driver for their inclusion in Daniels developments. Despite Daniels' comprehensive decarbonization strategy, these rooftop plots are not factored into the program, as their potential carbon impact is relatively minor compared to larger-scale opportunities within the building systems and technologies. Instead, the corporation highlights its urban agriculture efforts through annual social impact reports, where the number of allocated garden plots is tracked as a measure of community engagement and social infrastructure.

Daniels views rooftop gardens as an opportunity to reconnect people with food systems, and support physical and mental well-being of their residents. In fact, the majority of growers in these spaces have little to no previous gardening experience. For potential renters and buyers downsizing from homes with yards, these rooftop plots offer a meaningful alternative that retains a connection to gardening. There is also improved community engagement with strengthened social ties – improving the overall retention rates of their buildings. The co-founder of Hoffmann Hayes, Jane Hayes, believes that the garden plots help with the overall collective success of Daniels' buildings. In fact, the physical maintenance of the building is often improved because residents develop a shared sense of ownership and care.

These residential rooftop agricultural spaces bleed into the broader social life of the building itself, enhancing community identity and cohesion. As Daniels' Senior Manager of Social Impact, Fatima Saya

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notes, “If we are going to ask people to live in small boxes in the sky, we must provide them with spaces that offer joy, connection, and a sense of purpose.” Rooftop agriculture does just that, reintroducing the shared commons into high-rise living.

Scaling Up: Policies and the Role of Designers and Developers

Toronto’s development pipeline expects over 500 new high-rise towers in the next six years. This presents a major opportunity for scaling up rooftop agriculture, particularly in the residential industry. Rising construction costs have led some developers to opt for cash-in-lieu rather than meeting the requirements of the Green Roof By-law, revealing a key limitation of relying solely on regulation to implement green infrastructure. Investment in nature is vulnerable to economic downturns and shifting political priorities. A more resilient approach would embed nature into the cultural and physical fabric of communities – creating spaces people value not just for utility, but for meaning and connection. In tandem, a fail-safe approach would sew nature into the very fabric of the community, such that it sets up a cultural expectation and norm. Perhaps the fact that rooftop agriculture is not recognized and quantified as part of the City’s green infrastructure portfolio, but instead as social capital, is operating as an advantage at this moment in time.

While current regulations may lack specific guidelines or incentives for rooftop agriculture, design professionals can bridge this gap through advocacy and innovation. Architects and landscape architects have an opportunity to take the lead in promoting and creating “agriculture-ready” buildings. This means designing rooftops with suitable structural load capacities, water access and thoughtful layouts that support food growing and community programming. By recognizing rooftop agriculture as a vital component of urban design, we can create natural capital with community value beyond the typical metrics measured by green infrastructure policies and frameworks. **LP**

4 ONE PARK PLACE ROOFTOP GARDEN PLOTS (2015). **5,6** EVOLV ROOFTOP GARDEN PLOTS (2021). **7** LIGHTHOUSE WEST TOWER (2020).
PHOTOS 4-7 HOFFMANN HAYES

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