

UBC Social Ecological Economic Development Studies (SEEDS) Sustainability Program

Student Research Report

**Making Space for Urban Agriculture in Multi-unit Residential Buildings:
Guidelines for Developers and Recommendations for Policy**

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MAKING SPACE FOR URBAN AGRICULTURE

in multi-unit residential buildings:
guidelines for developers and
recommendations for policy



Report by Kristy McConnell
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Report by Kristy McConnel, in partnership with the UBC SEEDS Sustainability Program, Adera Homes, and E3 Eco Group.

Title Photo: The James (2014).

A communal garden on the rooftop of The James, a mid-rise residential building in Southeast False Creek in Vancouver. (Source: The Straight)

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Executive Summary

This report explores the provision of garden space in multi-unit residential buildings, as a way to improve the environmental and social sustainability of buildings, while improving marketability and the supply of garden space to meet latent demand for space to grow food.

The project had three key objectives. First was to identify trends in policy and development in Metro Vancouver with respect to urban agriculture. Next was to understand demand and marketability of garden space to Metro Vancouver residents of multi-unit residential buildings. And last was to provide a set of guidelines for developers to provide space for urban agriculture in multi-unit residential buildings.

A mixed-methods approach of both primary and secondary research was used to address the objectives of the project. A policy analysis was conducted to understand development trends and changing preferences. A survey was deployed in order to understand market preferences of existing residents of multi-unit residential buildings. Additionally, key informant interviews were conducted to understand challenges and opportunities in providing garden space in multi-unit residential buildings.

The report presents a set of guidelines for developers. First, key considerations on the physical characteristics, rights of use, and management models of spaces are provided. Following this, benefits and drawbacks are presented for four garden typologies: Patio Gardens, Allotment Gardens in a Common Area, Communal Gardens in a Common Area, and Rooftop Gardens.

Policy recommendations are provided for both developers and policy makers as follows:

Recommendations for developers:

- Capitalize on early-adopters advantage by providing garden space now, before trends become policy
- Provide a diversity of garden typologies to appeal to a broader market
- Encourage formal management of garden space through negotiation with property managers
- Conduct ongoing monitoring and evaluation to allow for improvements in future developments.

Recommendations or policy-makers:

- Incentivize developers by recognizing garden spaces in sustainability assessment tools.
- Differentiate between garden typologies according to their respective benefits.
- Require garden space is provided to 30% of residential units.
- Avoid development that adversely impacts existing garden spaces.

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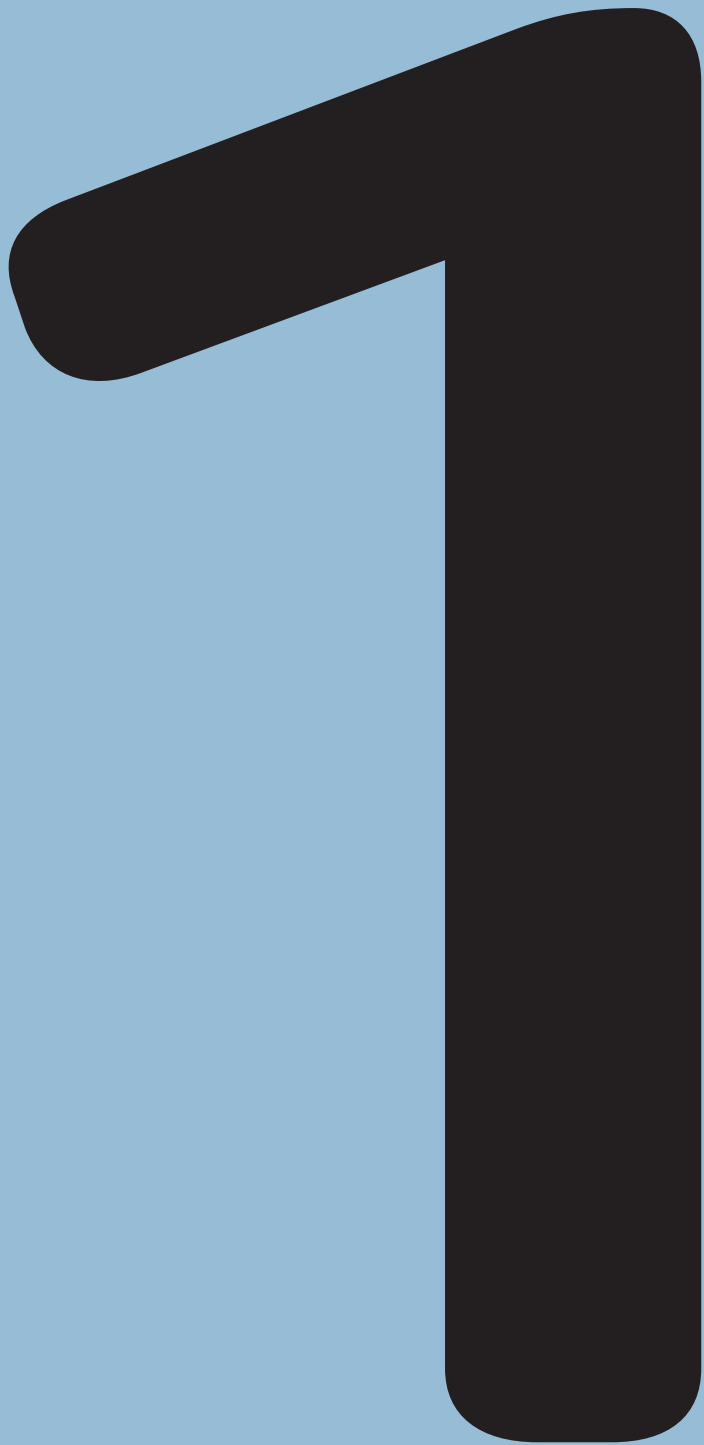
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Introduction

Metro Vancouver has seen tremendous growth in urban agriculture in recent years. There has been increasing news coverage on the topic, and policies are changing to become more supportive of agricultural activities in urban areas. Additionally, community gardens throughout the region have multi-year waiting lists, suggesting latent demand for space to grow food in the region.

It is expected that 1.2 million new residents will live in Metro Vancouver by 2041. Of these new residents, 80% are expected to live in multi-family housing. It is therefore critical that these spaces are designed to meet the needs of present and future occupants.

Although it is ultimately a resident's decision as to whether they grow food at home or not, developers play a key role in determining whether or not to provide garden space at new developments. Providing ecologically sound planting can be used by developers to leverage points for green building certification programs like LEED, however, there is currently a lack of knowledge on the types of garden space for urban agriculture that are most marketable and beneficial to potential residents.

This report explores the provision of garden space in multi-unit residential buildings, as a way to improve the environmental and socially sustainability of buildings, while improving the supply of garden space to meet latent demand for space to grow food. The following report is intended to support developers in making informed decisions about the provision of garden space in new developments, and additionally provides recommendations for policy makers.

Objectives

identify

trends in policy and development in Metro Vancouver with respect to urban agriculture.

understand

demand and marketability of garden space to Metro Vancouver residents of multi-unit residential buildings.

provide

a set of guidelines for developers to provide space for urban agriculture in multi-unit residential buildings.

Methodology

A mixed-methods approach of both primary and secondary research was used to address the objectives of the project. A literature review was conducted to understand potential garden typologies and their respective benefits and drawbacks in terms of social and environmental benefits, demand for gardens in urban areas, and policy trends in Metro Vancouver.

Development trends in Metro Vancouver over the last 30 years were analyzed in order to understand changing market preferences. Additionally, a survey was conducted of residents living in multi-unit residential buildings in Metro Vancouver to understand their preferences with respect to garden typologies. Quantitative data was analyzed to determine preferences, and qualitative data were coded into themes to reveal motivations for the preferences identified.

Finally, in order to understand best practices for providing garden space in multi-unit residential buildings, informational interviews were conducted with garden managers. This provided an understanding of features of successful garden spaces, as well as key challenges and potential tools for mitigating these challenges. The research and analysis was utilized to develop a set of guidelines and some key recommendations for policy, both of which are summarized in the following report.

This project is a capstone project, completed in partial fulfillment of the degree requirements of the Master of Community and Regional Planning at the University of British Columbia from September 2016 to April 2017. Research was completed in partnership with the UBC SEEDS Sustainability Program, Adera Homes, and E3 Eco Group.

Limitations

There were three key limiting factors in this work: scope, access to property managers for interviews, and limited research availability on baseline conditions.

Scope: This work was limited in scope to understanding trends and preferences in Metro Vancouver, with the majority of the work focused on the City of Vancouver, with consideration for the University of British Columbia's context. Additionally, the garden typologies explored were limited in scope to low- to mid-rise multi-unit residential buildings. This reflects the needs of the project partner, however limits the scalability of the work.

Access to property managers: In order to understand key successes and challenges with garden spaces, the intention was to connect with property managers at buildings with existing spaces. Documentation of these spaces was very limited, and in fact the majority of spaces are volunteer run, making it difficult to access the knowledge holders. Though the small sample of four garden managers interviewed was a limiting factor, redundancy in responses suggests validity of the collected data.

Research availability: Although urban agriculture is a hot button issue in the region, and grey literature suggests a demand for space to grow food, there is little existing literature documenting two critical pieces of information: location of existing spaces and local demand for space. While this report begins to fill that gap, further research is required.

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context.

Policy Trends

A review of policies in Metro Vancouver and the City of Vancouver evidences both an increasing interest in food systems, as well as increasing support from government. The City of Vancouver first recognized sustainability as a priority in 2002, and in 2007 adopted the Vancouver Food Charter which presents a vision for a socially and environmentally sustainable food system, and makes a specific call to expand opportunities for urban agriculture.

From 2009-2016 there has been ongoing and increasing development of food policies. In recent years, the City of Vancouver has adopted the Vancouver Food Strategy, and the Urban Agriculture Policy for Parks, demonstrating a commitment to creating a stronger urban food system, and healthier communities.

With the adoption of the Regional Food Systems Action Plan in 2016, Metro Vancouver has targeted actions to work toward full implementation of the 2011 Food Systems Strategy. The first goal of this strategy is to increase capacity to grow food close to home.

Wellbeing is also increasingly a priority in the region. The Healthy City Strategy in the City of Vancouver was adopted in 2014 and includes a goal of a healthy and just food system. The University of British Columbia is currently working to develop a green building plan, and initial publications indicate that wellbeing will be a priority. As there are both social and ecological benefits to garden space, it is likely that Metro Vancouver's regional and local governments will continue to support agriculture at multi-unit residential buildings, and may eventually formally require it.



Trends in Development

Just as policies have increasingly supported urban agriculture, development trends in the region also suggest a market demand for space to grow food at home. A scan of real estate listings in Vancouver reveals a transition in the stock of multi-unit residential buildings. Development in the 1990s tended not to have patios, to have narrower setbacks and placed little emphasis on the public realm. Moving into the early 2000s, buildings increasingly had public space, and elaborate landscaping was on the rise. In the last decade in the City of Vancouver, there has been a massive expansion in the inclusion of agricultural spaces in developments. Gardens can be found in Vancouver's tower-podiums at North East False Creek, and are a prominent feature in Olympic Village. This is presumably a result of both the City's policies and consumer preferences.



The Bel Aire (*Vancouver, 1990*). A typical 1990s multi-unit residential building in Metro Vancouver, the Bel Aire, has no patios, and a small lawn with basic landscaping. (Source: Equitable Real Estate)



The Greenwich (*Vancouver, 2000*). In the early 2000s, multi-unit residential buildings in Metro Vancouver saw an increase in green space, mostly in the form of lawns and landscaping (Source: Residency)



The Rise (*Vancouver, 2008*). In recent years, developers in Metro Vancouver have become interested in providing high quality spaces, often including space for urban agriculture (Source: Grosvenor).

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guidelines.

Guidelines in Context

The following sections provide a set of guidelines for developers to provide space for urban agriculture in multi-unit residential buildings. First, key considerations are noted in terms of physical features, rights of use, and management models. Next, four garden typologies are discussed in terms of their respective benefits and drawbacks. While more extensive guidelines on garden design are available from other sources, these are intended to be a quick reference that can help to flag any potential issues early in the development process.

The survey conducted received 105 responses. Of these, 100 indicated that they would like to have access to a garden space, with 5 indicating no interest. Of the 100 respondents interested in having access to garden space, 55% said they would prefer a private garden space, while 45% preferred access to a shared garden space. Overall, 48% of gardeners said they would pay between \$10 and \$50 per month to access a garden space, but this was highly dependent on the size, quality, and convenience of access to the space.

Of all respondents, 66% indicated that it was important to them to grow some of their own food. The respondents overwhelmingly valued green space, with 96% strongly agreeing with the statement, “Overall, I consider green space to be a valuable asset,” and 98% indicating that it is important they have access to green space close to home. The number one barrier to gardening was access to space, and the second most common barrier was lack of sunlight.

Respondents ranged in age from age 19 to 75 with the majority of respondents aged 25-55 years. The dominant housing types of residents were apartment buildings of less than five storeys and of more than five storeys, making up 55% and 34% of responses respectively. The remaining respondents lived in mixed-use buildings (3%), row houses (6%), and semi-detached homes (2%).

By the Numbers

demand

95% of respondents indicated that they would like access to a garden space.

preferences

55% would prefer access to a private garden space, while 45% would prefer access to a shared garden space.

cost

45% of respondents would be willing to pay to access garden space.

barriers

the number one barrier identified to gardening at home was lack of space.

Key Considerations

When providing space for urban agriculture in multi-unit residential buildings, there are three broad categories for consideration to ensure the success of spaces: physical features, rights of use, and management models. These considerations are relevant regardless of garden typology, and can support decisions surrounding garden design and implementation.

Physical Features

The physical features of a garden space play a key role in the success of crops, and accessibility for users. Of particular relevance are the following:

Space: A minimum soil depth of 30 cm is required for most plants, while a 60 cm depth is ideal. The total area of plots should also be considered, keeping in mind that a good rule of thumb is 1 square foot per plant.

Solar exposure: Adequate exposure to sun is critical to plant growth. Garden spaces will ideally have a minimum of 6 to 8 hours of direct sun exposure during the growing season.

Soil: At the time of implementation, it is critical that high quality soil be used in garden beds as amending poor quality soil can be a lengthy and expensive process.

Infrastructure: High quality materials should be used to create garden beds to reduce the frequency of replacement. Note that even the most durable materials will eventually break down due to exposure to the elements, so replacement is inevitable in the long run.

Accessibility: The height, location of, and space between beds will impact accessibility for those with mobility restrictions. Future users of the space should be considered in design.

Rights of Use

Rights of use refers to whether a garden space is shared or private. Of residents surveyed for this project, when asked about their preferences for shared versus private garden space, 45% preferred shared space, while 55% preferred a private space. Their reasons are provided below. Of total respondents, 13% noted that they are flexible about shared versus private space, as long as they can access the space conveniently.

Shared: Of respondents who would prefer access to shared space, 63% cited opportunities for community building as their main reason. The remaining respondents preferred shared spaces for a variety of reasons, notably opportunities for increasing efficiency of production, and sharing of tools and responsibilities.

Private: Of the respondents who would prefer a private space, the primary reason was a desire for privacy and solitude. Additional concerns included conflict with other gardeners, and potential for theft of produce.

Management Models

While private garden spaces with restricted access, such as those on a patio or private rooftop will presumably be self-managed by the owner, any space with shared access will require management to oversee operations. Two models emerged during this research: volunteer management, or formal management through strata. The potential upsides and downsides to each are discussed here, but are further contextualized in the following sections.

Volunteer: Utilizing volunteers to coordinate garden spaces while avoiding costs on the surface leads to challenges with effective space management. Key informant interviews revealed an increased risk of conflict using this model, and can result in poor upkeep of the space.

Formal: While there may be costs associated with having formal management, employed by a strata or otherwise, research found significant benefits in terms of upkeep, reduced conflict, and overall satisfaction with garden spaces using this model.

Typology 1

Patio Garden

Patio gardens typically appear as either a series of containers, or small planters located on a private patio. The main limiting factors for a patio garden are typically space and light availability. Patios are often provided as an amenity regardless of whether the intention is for food growing space, and it is ultimately a resident's decision as to what they use the space for.

benefits

- + Self-managed
- + Privacy and solitude
- + Contribution to biodiversity
- + Supports well-being of residents

drawbacks

- Limited space
- Potential issues with sun exposure
- Inefficiencies in watering and yields
- Community building opportunities lacking
- No guarantee of food growth



Patio Garden. While patio gardens are convenient for the user, and offer a place of privacy and solitude, they also offer limited and inefficient growing space in terms of yields and water use. Limited light is another key issue, as demonstrated in this photo. While sun reaches the sidewalk below, there is no direct exposure to the vegetation. (Source: Inhabitat)

Typology 2

Allotment Garden in Common Area

An allotment garden in a common area is typically found in the form of a series of raised bed planters. Each planter (or a portion thereof) is allotted to an individual resident or family, who is responsible only for their own plot.

benefits

- + Increased space
- + Opportunities for community building
- + Contribution to biodiversity
- + Supports well-being of residents
- + Opportunity to share tools and water source

drawbacks

- Limited space per resident
- Potential for conflict
- Potential for theft
- Limited opportunities for participation
- Requires management and organization



Allotment Garden at the Rise. Allotment gardens in a common area can provide opportunities for community building, and have the potential for higher yields than most patio gardens. The garden at The Rise on Cambie, shown above, is coordinated by the property manager. Plots have been split in half allowing for a high participation rate by residents, and the waitlist for a plot is short. (Source: Grosvenor)

Typology 3

Communal Garden in Common Area

A communal garden in a common area refers to any garden space in a common area, where the entire space is gardened collectively and yields are shared among participants. Responsibilities and resources are shared by all participants.

benefits

- + Higher efficiency and increased yields
- + Opportunities for community building
- + Contribution to biodiversity
- + Supports well-being of residents
- + Sharing of all resources

drawbacks

- Challenging management
- Potential for conflict
- Fair distribution of labour challenging



Communal Garden. Communal gardens can be a tremendous opportunity for community building and social interaction. Management can be challenging, however. In this study, two volunteer coordinators of communal gardens were interviewed and found the workload to be significant. They also found the position rewarding, and noted high participation rates by residents. (Source: Spacing Magazine)

Typology 4

Rooftop Gardens

Rooftop gardens typically take the form raised bed planters, but could also utilize a series of containers to create space for food growth. They offer the opportunity to make highly habitable spaces in otherwise underutilized spaces.

benefits

- + Potential reduction in urban heat island effect
- + Contribution to biodiversity
- + Supports well-being of residents
- + Increase in habitable space on development site

drawbacks

- Challenging growing conditions (wind and sun burn)
- Intensive infrastructure requirements
- Potential management issues



Rooftop Garden in Northeast False Creek. Rooftop gardens can offer a place of refuge from busy city streets, contributing to the well-being of residents. They also have the potential to contribute to biodiversity, and reduce urban heat island effect. However, as building height increases, the growing conditions become less favourable, with potential for sun and wind burn. Other challenges include transportation of materials, and challenges with rights of access. (Source: City Farmer News).

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recommendations.

Recommendations for Developers

Based on trends in policy and development, as well as consumer preferences identified in this research, there is evidence of demand for space for urban agriculture in multi-unit residential buildings. In addition to the guidelines outlined in this report, there are four key recommendations provided here for developers.

First, it is recommended that developers begin providing garden space early and often. Clear trends toward support for urban agriculture have surfaced in this research, and it is possible that space for urban agriculture will be required in developments in the near future. Developers who provide garden spaces now will benefit from early-adopters advantage.

Next, it is recommended that a diversity of garden spaces are provided within each development. For example, both private spaces on patios, and a garden in common areas could be provided. This variety will increase marketability to a broader variety of consumers.

Additionally, it is recommended that a formal management structure is negotiated with property managers as developments are completed. A formal management structure reduces instances of conflict and can ensure successful operation of garden spaces.

Lastly, ongoing monitoring and evaluation is recommended. Developers should regularly contact managers of existing sites to learn what is working, and how spaces can be improved in future developments.

Key Actions

capitalize

on early-adopters advantage by providing garden space now, before trends become policy

diversify

by providing a variety of garden typologies to appeal to a wider market

encourage

formal management by negotiating arrangements with property managers

monitor and evaluate

check-in with property managers to see what's working and what's not

Recommendations for Policy Makers

While policies in Metro Vancouver have been increasingly supportive of urban agriculture, signalling a recognition of the value of growing food in cities, below are some key recommendations that apply specifically to urban agriculture in multi-unit residential buildings.

First, there is an opportunity to better incentivize developers to provide garden space in developments through sustainability rating tools, such as LEED, or UBC's Residential Environmental Assessment Program. By increasing weighting of gardens in these frameworks, policy can help to increase the provision of garden space.

Second, when considering sustainability rating tools or other methods of incentivization, policy-makers should differentiate between different garden typologies. Certain garden spaces (such as communal gardens in common spaces) provide increased social and environmental benefits when compared to others (such as patio gardens). They should be considered accordingly.

Third, it is recommended that policy require access to garden space for 30% of residential units in new developments. While this is currently provided as a guideline for developers by the City of Vancouver, it is necessary to formalize the guideline as a policy requirement to ensure developments are meeting the needs of current and future populations in the region.

A final consideration is to ensure that any new development proposals will not have adverse effects on existing garden spaces, particularly by reducing solar exposure. Preserving existing assets is a key piece of a healthy built environment.

Key Actions

incentivize

developers who provide garden space by providing an increase in recognition of their value

differentiate

between garden typologies, and reward those with greater benefits accordingly

require

that space to grow food be provided to at least 30% of residential units

avoid

development that adversely impacts existing spaces for urban agriculture

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conclusion.

Conclusion

As populations continue to grow in the region, it is critical that we develop spaces that meet the needs of current and future populations. Making space for urban agriculture in multi-unit residential buildings can increase both the environmental and social sustainability of developments. Results of this research suggest a strong market for garden space. As urban food production is increasingly a policy priority, developers who begin providing garden spaces now can benefit from early-adopters advantage. Utilizing the guidelines provided in this report, and supported by ongoing monitoring and evaluation, developers can ensure that garden spaces are well-designed, and increase marketability of developments.

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