

## COMMITTING TO VERTICAL GROWTH – THE NEXT PHASE OF AGRICULTURAL PRODUCTION

### Issue

Farming is an expensive career path. Youth are finding it more and more difficult in accessing funds to pursue farming even though their families have been farming for generations. Fewer farmers leads to food insecurity and raises the price of food with broader economic implications.

Many regions across BC are facing land shortages. This issue of land shortage is primarily occurring in the Lower Mainland. It is an issue that will permeate throughout the province. With a growing population, more land is being set aside for housing, limiting agricultural land space.

With the increased difficulty in entering the traditional farming sector, and the advent of technological advancements, municipalities across the province need to capitalize on innovative growing practices that are both space-saving and highly productive. One option is that these systems can come in the form of vertical growing in light-industrial zones. By utilizing industrial areas as well as traditional agricultural zones, high-tech facilities can be utilized or built to produce more than what was possible on traditional agricultural land.

### Background

#### Cost of Farmland Across BC

The price of land is increasing across the province. On Vancouver Island, average farmland values across the island have risen a shocking 21.7% this 2018, the highest regional increase in Canada. The increase is partly driven from the previous year's boom in the South Coast region. The average cost per acre was \$50,858, with a range of \$21,500 – \$79,300.

The Okanagan holds the record for the highest average farmland values across Canada at \$97,903 per acre.<sup>1</sup> The main economic driver behind the cost of farmland in the region is the wine industry, and the regional conversation is all about vineyard establishment and expansion. Combined sales from BC breweries, wineries, and distilleries amounted to \$1.3 billion in 2016.

The Cariboo-Chilcotin region saw a 12.8% increase in farmland values, while the Peace Region-Northern B.C. had a 6.6% increase, with the highest quality land going for a premium. A few years ago new farmers could reliably relocate north to purchase land and escape from Southern B.C. real estate hotspots, they are now finding themselves priced out of the market all across the province.

The South Coast region, which includes Metro Vancouver and the Fraser Valley, showed an overall 6.7% average increase in farmland value between 2017 and 2018. There was a higher demand from the eastern Fraser Valley which tends to have lower value than the West. High costs of land make it difficult for farmers to make a profit.

#### Food Insecurity

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<sup>1</sup> <https://www.fcc-fac.ca/fcc/about-fcc/reports/2018-farmland-values-report-e.pdf>

The inability for new farmers to enter the market due to exorbitant land costs, and the fact that other countries are able to produce for much cheaper adds to the food insecurity problem. High prices may drive people away from consuming locally even though there is a market for people who want to consume locally produced goods.

Population growth in BC will also increase the amount of food consumed in BC. It is projected that there will be an annual population growth of 1.2% in BC from 2019 to 2041. The highest growth areas will be the Mainland/Southwest, which includes Vancouver, Burnaby, the Tri-Cities, Richmond, New Westminster, Surrey, White Rock, Langley, and Abbotsford. The other highest growth area is the Nechako region.

### **BRITISH COLUMBIA POPULATION BY DEVELOPMENT REGION**

Development Regions	Population as at July 1st (000s)			Average annual growth
	2019	2030	2041	2019- 2041
Van Isle/Coast	828	956	1,018	0.8%
Mainland/Southwest	3,093	3,608	4,072	1.4%
Thompson Okanagan	590	653	701	0.9%
Kootenay	160	166	165	0.1%
Cariboo	166	174	174	0.2%
North Coast	59	64	65	0.5%
Nechako	41	48	54	1.4%
Northeast	72	80	84	0.7%
<b>B.C. Total</b>	<b>5,050</b>	<b>5,750</b>	<b>6,334</b>	<b>1.2%</b>

*Source: BC Stats*

### Innovation

Food and agriculture innovation have generated remarkable amounts of investor capital in recent years and could become a \$700 billion market globally by 2030, according to a Union Bank of Switzerland.<sup>2</sup> One innovative form of farming includes vertical farming.

Vertical farming is new form of farming that allows for the production of crops, such as leafy greens, on minimal land space. This farming method uses the concept of controlled environment agriculture, and stacks production space upon itself like a high-rise building.<sup>3</sup>

Vertical farms must overcome the financial challenge of large start-up costs. Since they can be located in the centers of major cities, owners of vertical farms would have to pay the occupancy costs that any other office in the same zone would have to pay if zoned the same. A vertical farm with a yield per hectare

<sup>2</sup> <https://www.ubs.com/global/en/ubs-society/our-stories/2019/future-of-food.html>

<sup>3</sup> Birkby, Jeff (January 2016). "Vertical Farming". *ATTRA Sustainable Agriculture Program*. Retrieved October 28, 2019.

factor 50 times larger than a traditional outdoor farm's yield, it would take 6-7 years for the vertical farm to break even in costs<sup>4</sup>.

And because profitability is so elusive, some of the early promises of high-tech urban agriculture and vertical systems are slow to be realized. Steep start-up costs mean farmers must grow crops that generate major cash: specialty items, such as flowers, or crops that have quick growth cycles, such as leafy greens. The five main indoor crops that can be grown in a vertical farm are leafy greens, microgreens, herbs, flowers and tomatoes, items that are a pull for those of high socioeconomic status but aren't go-to products for low-income people.

Additional potential benefits of vertical farms include:

- More efficient use of limited land base (0.2h equivalent to 1.6-2.4h), onsite processing, energy sales from methane produced by compost, proximity to employees and markets<sup>5</sup>,
- Year-round production, no weather-related crop failures, no agricultural runoff, allowance for ecosystem restoration, organic premium, water use reduced 70-95% relative to outdoor crops, reduced food miles, control over food safety and security, purification of gray water to drinking water, animal feed from postharvest plant material<sup>6</sup>,
- Close integration of agricultural amenities into urban planning with agricultural capacity scalable to urban growth, cycling of organic resources, reduction or elimination of "food deserts", increase in local employment, and revitalization of urban areas in decline<sup>7</sup>

### Moving forward

With SFU launching the urban agriculture program and KPU's existing horticulture, agriculture and food-system programs, the ongoing dialogues about local food security combined with the ALR challenges, there's already a convergence occurring around making food systems more compact and efficient, which Surrey could use as a launching pad for pitching the eco-industrial "discovery" park and the vertical farm. This could be the location of a pilot project. The potential could be realized across the province but to start, there needs to be an investment from the Province, Municipal, and Federal Governments.

Vertical farms can and have happened in major city centres.<sup>8 9 10</sup> Municipal governments could move this new discipline forward if they can be encouraged to broaden their land designations/zoning categories. Currently in many municipalities, farming can only occur on designated farming land. This however needs to be amended to allow innovation such as vertical farming to develop.

### THE CHAMBER RECOMMENDS

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4 Benke, Kurt; Tomkins, Bruce (2017-01-01). "Future food-production systems: vertical farming and controlled-environment agriculture". *Sustainability: Science, Practice and Policy*. **13** (1): 13–26. doi:10.1080/15487733.2017.1394054

5 Ladner, Peter (2010), Ch. 20 Economic Potential of Urban Agriculture, "Agricultural Urbanism" 1<sup>st</sup> Ed. HB Lanarc Consultants Ltd.

6 Despommier, Dr. Dickson (2010), Ch. 5 The Vertical Farm: Advantages, "The Vertical Farm: Feeding the world in the 21<sup>st</sup> century" Thomas Dunne Books

7 Fraser, Bud (2010), Ch. 15 Integrated Infrastructure for Local Food and Agriculture, "Agricultural Urbanism" 1<sup>st</sup> Ed. HB Lanarc Consultants Ltd.

8 <https://makinglewes.org/category/eco-industrial-parks/>

9 <https://www.canadianarchitect.com/centennial-college-and-utsc-are-planning-canadas-first-net-zero-vertical-farm/>

10 <https://www.washingtonpost.com/business/2019/11/19/indoor-farming-is-one-decades-hottest-trends-regulations-make-success-elusive/>

That the Provincial Government:

1. Work with municipal and federal government to allocate funding for innovative research in vertical farming;
2. Work with municipalities to ensure that vertical farming can occur in light-industrial zones by amending land designations, with the stipulation that it is not ALR space being rezoned; and,
3. Set up a task force to develop the project with relevant stakeholders.

**Submitted by the Surrey Board of Trade**