# GARDEN HUB

GROWING FOOD, GROWING COMMUNITY

**PLAN 341 Start-up Pitch Group Report**

Christa Yeung | Julia Zhu | Jasmin Senghera | Aaron Li |
Nicholas Wu | Aubrie Boyer

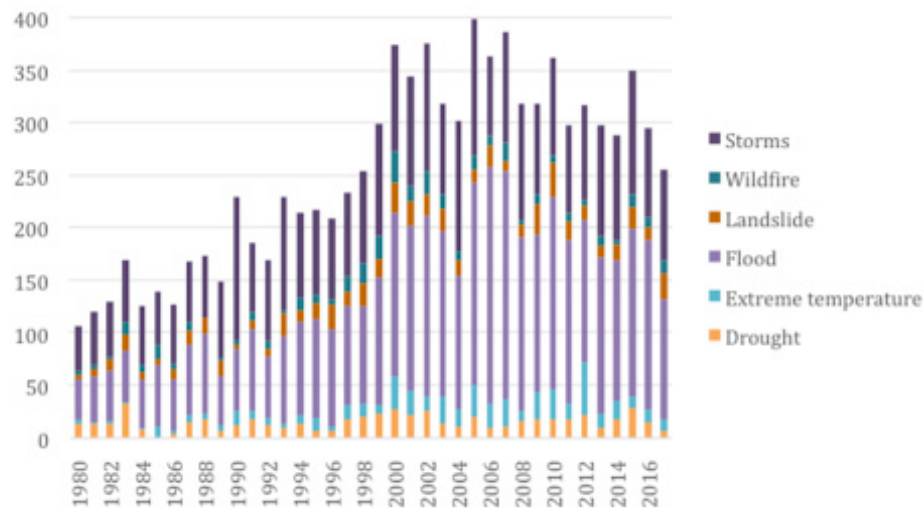**Our Big Problem: Food System Vulnerabilities**



Figure 1.  Reported Extreme Weather-related natural disaster events internationally, 1980-2017. Source: Metro Vancouver Climate 2050 (2018). Climate Change Data and Trends. Metro Vancouver.

Over the next 30 years, climate change is projected to increase regional temperatures by an average of 3°C and increase the frequency of extreme weather events such as floods and fires (Metro Vancouver, 2016). How will this affect the availability and access to food? For Vancouver, food is part of a complex balancing act of international production, processing, distribution and local consumption. The unprecedented challenges of climate change places our current globalized food systems at risk. Interruptions in food supply, loss of agricultural land, and rising food costs due to transportation, require the City of Vancouver to rethink how they can shape a more resilient and self-sustaining system for the future (Vancouver Food Strategy, cite; Sage, 2014).

Resilience is defined as the capacity for communities to adapt to social and environmental disturbances while maintaining the functionality of its systems (Sage, 2014). In the context of food system resilience, this means that cities like Vancouver must prepare to provide sufficient, appropriate, and accessible food to all citizens despite the the ecological, social, and financial shocks to our food system (Tendall et al., 2015). This is part of a larger environmental movement in cities around the world to localize food production through community gardening as municipalities transition towards a more self-sufficient and resilient mode of urbanization (Sage, 2014).

TO BUILD A MORE RESILIENT FOOD SYSTEM, VANCOUVER NEEDS TO:

1. Grow more local food

2. Reconnect people to local food production

3. Equip individuals and communities with the right knowledge and skills to create self-sustaining food systems.

**Where we are now:**
**Food System Vulnerability**

**Where we need to be:**
**Food System Resilience**

How do we overcome existing barriers?
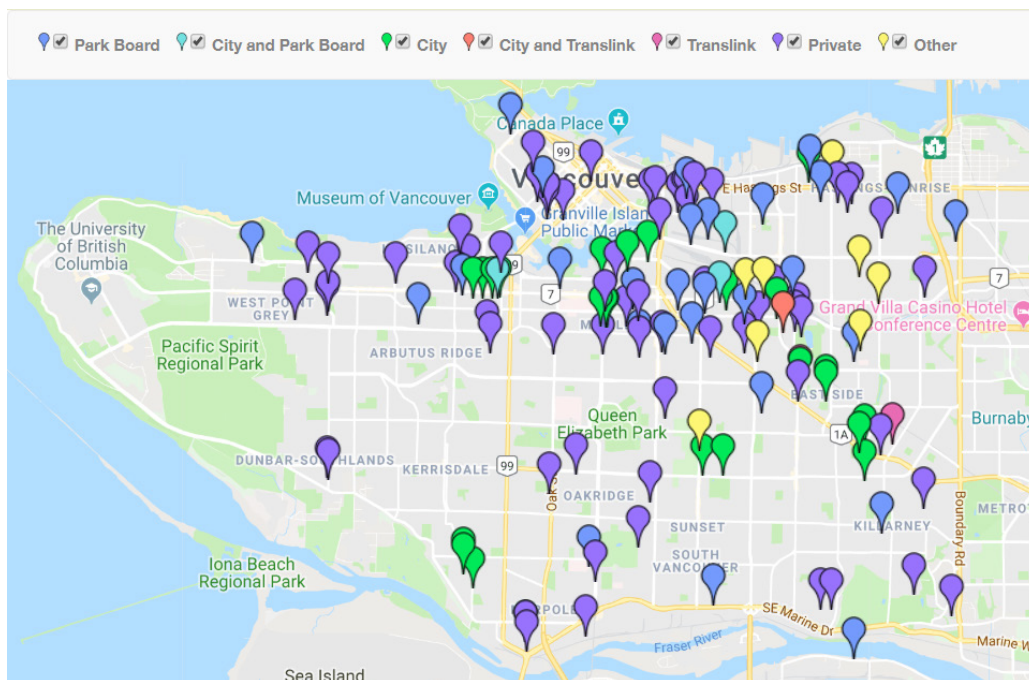
**Local Barriers**



Figure 2. All community gardens in the City of Vancouver listed on their public site.

## WHAT BARRIERS DO GARDENERS FACE?

Demand > Supply of Garden Plots

At the present time, the demand for community gardens exceeds the number of community gardens available in Vancouver. There is a total of 110 community gardens in the City of Vancouver, each with varying numbers of plots managed by the Park Board, City, Translink, private owners, and other local organizations. To gain an understanding for the demand of community gardens, we surveyed a handful of community garden associations across Vancouver such as the Pine Tree Community Garden on West 6th. Survey results informed us that community gardens have a one to five year wait. This could greatly discourage many potential gardeners who are looking to produce their own food or learn important gardening skills.

While the City does try to create three new gardens per year, this is not sufficient to meet the incredible demand for gardening opportunities (Wintonyk, 2011). Garden Hub works to address this barrier to meet our goal of connecting more people to local food production.

Accessibility and Data Management

At the present time, there is no central place, website or online structure made available by the City where Vancouver residents can efficiently gather information about local community gardens and register to join one. This means each garden must be individually emailed, phoned, or visited in person which can be inconvenient and time consuming.

While the City of Vancouver does provide an interactive map of garden locations, and an Open Data spreadsheet of emails to contact for registration, notes on food assets, and types of crops grown, much of it is inaccurate, inconsistent, out of date and most importantly, not very user friendly (City of Vancouver Open Data Catalogue, n.d).

| MAPID | YEAR_CREATED | NAME | STREE_ST | E | STREET_NAME | STREET_TY | MERGED_ADDRESS | LATITUDE | LONGITUDE | NUMBER_OF_PLOTS | NUMBER_OF_FOOD_TREES | FOOD_TREE_VARIETIES | OTHER_FOOD_A |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FA001 | Pre-2010 | 0 - Private Developments - Community Shared | | | | | | | | 507 | | | |
| FA002 | 2014 | 15th Avenue Coop | 1255 | E | 15th | Av | 1255 E 15th Av, Vancouver, BC | 49.2571193 | -123.0788387 | 8 | | | |
| FA003 | 2008 | 16 Oaks | 1018 | W | 16th | Av | 1018 W 16th Av, Vancouver, BC | 49.2567482 | -123.1276645 | 55 | | | |
| FA004 | 2007 | 1755 West 14th - Private apartment building garden | 1755 | W | 14th | Av | 1755 W 14th Av, Vancouver, BC | 49.2590496 | -123.1448703 | | | | |
| FA005 | | 2624 Franklin St - Apartment | 2624 | | Franklin | St | 2624 Franklin St, Vancouver, BC | 49.2818051 | -123.0512664 | 2 | | | |
| FA159 | 2017 | 4th and MacDonald | | | | | | 49.268683 | -123.167928 | 100 | | | |
| FA152 | 2016 | Aberthau Garden Project | 4397 | W | 2nd | Av | 4397 W 2nd Av, Vancouver, BC | 49.2721428 | -123.2047777 | 10 | | | |
| FA006 | 2011 | Adanac Park Community Garden | 1025 | | Boundary | Road | 1025 Boundary Road, Vancouver, BC | 49.2755823 | -123.0243945 | 30 | | 8 | 1 Early McIntosh Apple; 1 Jonagold apple; 2 |
| FA160 | 2017 | Alma and 10th | | | | | | 49.26324 | -123.185464 | 100 | | | |
| FA008 | | Arbutus Village Park | 4202 | | Valley | Drive | 4202 Valley Drive, Vancouver, BC | 49.2507172 | -123.1549951 | 0 | | 9 | Crabapple |
| FA009 | 2010 | Atira Community Garden | 400 | | Hawks | Av | 400 Hawks Av, Vancouver, BC | 49.2810913 | -123.0871212 | 15 | | | |
| FA010 | | Barclay Heritage Square | 1433 | | Barclay | St | 1433 Barclay St, Vancouver, BC | 49.2873876 | -123.132845 | 0 | | 2 | Apple |
| FA011 | 2015 | BC Seniors Living Assoc. Garden | 3355 | E | 5 th | Av | 3355 E 5 th Av, Vancouver, BC | 49.266474 | -123.032578 | 11 | | | |
| FA012 | 2011 | Bosman Hotel | 1060 | | Howe | St | 1060 Howe St, Vancouver, BC | 49.2791632 | -123.1250943 | 12 | | | |
| FA013 | 2012 | Brewery Creek Community Garden | 2390 | | Brunswick | St | 2390 Brunswick St, Vancouver, BC | 49.2641649 | -123.0957332 | 40 | | 11 | Bramley's seedling apple; cortland apple; ear |
| FA169 | 2018 | Brightside Home Foundation - King's Daughters | 1400 | E | 11th | Av | 1400 E 11th Av, Vancouver, BC | 49.260319 | -123.075082 | 3 | | | |
| FA170 | 2018 | Brightside Home Foundation - Wallace Wilson | 1620 | E | 6th | Av | 1620 E 6th Av, Vancouver, BC | 49.264956 | -123.071167 | 3 | | | |
| FA161 | 2017 | Broadway and Alma | | | | | | 49.264105 | -123.185381 | 100 | | | |
| FA162 | 2017 | Broadway and Victoria | | | | | | 49.262089 | -123.064979 | 100 | | | |
| FA014 | | Burrard View Park | 650 | N | Penticton | St | 650 N Penticton St, Vancouver, BC | 49.2912065 | -123.0519175 | 0 | | 1 | Cherry |
| FA015 | pre-1970 | Callister Park | 2875 | | Oxford | St | 2875 Oxford St, Vancouver, BC | 49.28618 | -123.0453833 | 0 | | 4 | Apple |
| FA163 | 2017 | Cambie and 16th Avenue | | | | | | 49.256768 | -123.114695 | 100 | | | |
| FA016 | 2013 | Cambie Park Community Garden | 500 | W | 54th | Av | 500 W 54th Av, Vancouver, BC | 49.2213085 | -123.1186284 | 30 | | | |
| FA028 | 2009 | Cambridge Community Garden | 2050 | | Wall | St | 2050 Wall St, Vancouver, BC | 49.2854905 | -123.062203 | 5 | | | |
| FA017 | | Carnarvon Park | 2995 | W | 19th | Av | 2995 W 19th Av, Vancouver, BC | 49.2565789 | -123.171486 | 0 | | 15 | Apple |
| FA018 | 2011 | Cartier Park | 390 | E | 36th | Av | 390 E 36th Av, Vancouver, BC | 49.2376052 | -123.0975115 | 0 | | 6 | Apple |
| FA019 | 2008 | Cedar Cottage Community Garden | 2021 | | Stainsbury | Av | 2021 Stainsbury Av, Vancouver, BC | 49.251444 | -123.0642552 | 61 | | 13 | EARLY MCINTOSH; GOLDEN DELICIOUS S |
| FA020 | 2009 | Cedar Cottage Community Garden - Part 2 | 2019 | | Stainsbury | Av | 2019 Stainsbury Av, Vancouver, BC | 49.2512645 | -123.0644448 | 49 | | | |
| FA021 | 2013 | Cedar Cottage Neighourhood House Edible Garden | 4065 | | Victoria | Drive | 4065 Victoria Drive, Vancouver, BC | 49.2488871 | -123.0651476 | 12 | | | |
| FA022 | | Champlain Heights Park | 3351 | | Maquinna | Drive | 3351 Maquinna Drive, Vancouver, BC | 49.2164913 | -123.0326603 | 0 | | 1 | Apple |
| FA023 | 2010 | Champlain Place Community Garden | 3347 | E | 58th | Av | 3347 E 58th Av, Vancouver, BC | 49.2167296 | -123.0352463 | 8 | | | |
| FA024 | | Charles Park | 3400 | | Charles | St | 3400 Charles St, Vancouver, BC | 49.2732079 | -123.0308947 | 0 | | 1 | Crabapple |
| FA025 | 2013 | Charleson Park Community Garden | 999 | | Charleson | St | 999 Charleson St, Vancouver, BC | 49.2677648 | -123.125738 | 38 | | | |
| FA026 | 2009 | Chester's Field Garden | 5333 | | Chester | St | 5333 Chester St, Vancouver, BC | 49.236648 | -123.0896066 | 10 | | 3 | anjou dwarf pear; conference dwarf pear |
| FA027 | 2010 | Cheyenne Community Garden | 2755 | | Cheyenne | Av | 2755 Cheyenne Av, Vancouver, BC | 49.2414955 | -123.0480587 | 37 | | 7 | Plums, heritage apples |
| FA164 | 2017 | Chilean Housing Coop | 3390 | | School | Av | 3390 School Av, Vancouver, BC | 49.23112 | -123.032907 | 10 | | | |
| FA029 | 2008 | China Creek Community Garden | 1255 | E | 10th | Av | 1255 E 10th Av, Vancouver, BC | 49.2619932 | -123.0788681 | 23 | | 3 | 2 apple, 1 plum, and raspberry bushes |
| FA030 | 1993 | China Creek Housing Co-op | 1230 | E | 8th | Av | 1230 E 8th Av, Vancouver, BC | 49.2643106 | -123.0832689 | 30 | | | |

COMMUNITY_GARDENS

Figure 3. City of Vancouver Open Data spreadsheet of community gardens and food trees.

POTENTIAL GARDENERS MIGHT ASK:

• How long are waitlists?

• What types of crops can be grown?

• Is the garden targeted to youths or certain demographics in particular?

All of which cannot be known through the current limited platform. Access to information about community gardening should not have to be a barrier that stops citizens from participating in the local food systems.

WHAT BARRIERS DOES THE CITY OF VANCOUVER FACE?

Data Tracking

Without an up to date central system to record community garden data, the City of Vancouver cannot accurately track neighbourhood food asset growth. The City does not know how many gardeners are engaged per year nor how much and what kinds of local food are produced at community gardens. The City of Vancouver needs these vital sustainability metrics to determine if they are meeting their goal of creating a resilient food system.

## Policy Context: Why our Project Matters to The City as Investors

The City of Vancouver has implemented a Greenest City 2020 Action Plan which encompasses Vancouver's aim to become the greenest city in the world by 2020. This aim is based on the uncertainties the world faces in the future and in the present due to climate change. One of these goals include increasing neighborhood food assets which resonates very strongly with our website's ultimate goal to promote local food resiliency. These neighborhood food assets include community garden plots, farmers markets, community orchards, community composting facilities, community kitchens, community food markets, and urban farm. An update of the Greenest City Plan revealed that in 2017 Vancouver had implemented 600 new community garden plots since 2013 (City of Vancouver, 2018).

**LOCAL FOOD**
Total number of neighbourhood food assets in Vancouver

+53% 2020 Target

Source: City of Vancouver, Food Policy.

Figure 4. A depiction of the increase of food assets by 53% in Vancouver from 2010 to 2017.

All in all, there has been a 53% increase in neighborhood food assets since 2010 (City of Vancouver, 2018). Yet, these accomplishments may be diminished in the future as some community gardens are being considered as sites for new housing (City of Vancouver, 2018). Thus, the city will have to be more creative in regards to urban agriculture This makes Garden Hub increasingly important at this current time as it serves the purpose of increasing accessibility to urban gardening and alleviating the issue of the demand for gardening.

## SOLUTION

To address the problems defined previously, we are proposing a mobile website named "Garden Hub" that centralizes all information pertaining to community gardens in Vancouver. This website will include features that address each problem.

### Accessibility Solution

To solve the lack of accessibility of community garden information, we want to provide a feature that compiles waitlist information and community garden details. This will enable people to register for a garden plots and view wait times in one place rather than individually contacting each association to obtain this information. Once registered, these future gardeners can wait to receive a notification when a garden spot is available, they can accept the spot and will be automatically removed from all waitlists.

### Demand Solution

To solve the issue of large demand and reduced supply of community gardens we want to provide a message board feature that allows users to connect.  This feature would a) connect individuals who do not use their plot frequently with people who are interested in gardening and b) that connect individuals who are on large waitlists to connect and apply to create new community gardens. For solution a) people who already have community garden plots can recruit people to work on their garden plot either while they're away or on the days they don't use it. This way people who otherwise wouldn't have had the opportunity to garden get that opportunity and they can also divide the share of crops produced. For solution b) multiple individuals who want to garden in the same area on their own individual plots will be given the opportunity to create a new community garden rather than remaining on the waitlist for a long period of time. For those who want to create a garden on city-owned land, there is a call for proposals every spring. But for those who want to create a garden on non-city owned land, an application will be made available on the website. They must find the land themselves, but could receive up to $1000 from the city in assistance.

### Data Management Solution

To solve the issue of the inaccuracy and inconsistency of community garden data as well as the lack of unique data pertaining to the interests of gardeners we want to provide a filter feature that allows users to view all information about community gardens. Thus, gardeners can filter through factors such as demographics, food types grown, waitlist times, and garden fees to cater towards the unique tastes of the gardeners.

### Data Tracking Solution

To solve the lack of a centralized location to view and track the overall state of gardens and to solve tracking local food production by the City, we will implement a feature that allows the gardeners to track their crops. Since the City will own the application, they will have access to this data. The gardeners can upload information onto the website including the food types grown, the food yield, and the planting and harvesting dates. This enables local food production data to be collected and analyzed and there can be greater community garden engagement that would provide people who want to join a garden a better idea of what to expect.

These solutions thus make urban agriculture more accessible, ease the demand for community gardens, and increase data pertaining to local food production. This website will benefit people with a passion for gardening in Vancouver but who do not have the facilities to garden within their home, people on the community garden waitlist, and those who have challenges finding community garden related information.

# RESOURCE NEEDS

### Revenue generation

We have determined a few different ways to generate revenue. Given that our model so far has been directed towards providing a product for the City of Vancouver, our first goal would be to partner with the City of Vancouver directly and sell them the application upon completion. Other options for revenue generation include monetizing the application by putting gardening specific ads on the website, requiring the gardener to pay a small fee and applying for local grants.

### Local grants

There are numerous grants available in the Metro Vancouver area specifically for community gardening. The City of Vancouver provides a Green Grant which provide funding of up to $500 to support Greenest City targets and a Sustainable Food Grant that provide funding to build food access and food resilience. There are also grants provided by banks such as the Vancity Community Partnership program that fund up to $10,000. Eligibility for this grant is varied and can include applications that focus on growing sustainable food systems. The Vancouver Foundation provides $500 grants for ideas that help connect and engage people in Vancouver neighbourhoods. Spud provides up to $500 on programs that engage Vancouver residents including gardening initiatives.

### Budget

The first year of the budget makes the assumption that our proposal to the City of Vancouver is successful and we receive $375,000. As a small business, accounting, legal, marketing, and market research services will be contracted out to external firms. Three employees will be hired: two programmers and one community garden coordinator. The salary line item includes base salary, benefits and payroll costs. Office space will not be provided however, Garden Hub will pay for each employee's office supplies, phone plan, internet and new computer to enable them to work remotely. The programmers will be responsible for creating a working website and database with the required features. The coordinator will be responsible for being the liaison with community garden associations, creating their accounts and educating them about what the platform does and the benefits it can provide them and the community at large. The second year of the budget focuses on roll out the application in other communities where the focus of the budget will be primarily to on-board new community garden associations across Metro Vancouver and expand the reach of the application. Future years would continue along the same goals of expanding the user base to various communities across British Columbia and then in other provinces.

| | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 |
|---|---|---|---|---|---|
| **Cash Flow Carry Forward** | $0.00 | $10,580.00 | $17,060.00 | $16,940.00 | $16,820.00 |
| **Cash Inflow** | | | | | |
| City Grant | $375,000.00 | $230,000.00 | | | |
| **Cash On-Hand** | $375,000.00 | $240,580.00 | $17,060.00 | $16,940.00 | $16,820.00 |
| **Cash Outflow** | | | | | |
| Contractors | | | | | |
| Accounting | $3,000.00 | $3,000.00 | | | |
| Legal | $10,000.00 | $10,000.00 | | | |
| Marketing/Advertising | $40,000.00 | $30,000.00 | | | |
| Market research | $10,000.00 | | | | |
| Salary | $292,500.00 | $180,000.00 | | | |
| Office supplies | $200.00 | | | | |
| Phone plans | $300.00 | $200.00 | | | |
| Computers | $8,000.00 | | | | |
| Internet | $300.00 | $200.00 | | | |
| Web hosting and domain | $120.00 | $120.00 | $120.00 | $120.00 | $120.00 |
| **Total Cash Outflow** | $364,420.00 | $223,520.00 | $120.00 | $120.00 | $120.00 |
| **Net Cash Inflow (Outflow)** | $10,580.00 | $17,060.00 | $16,940.00 | $16,820.00 | $16,700.00 |

Figure 5. 5 year budget table

# IMPLEMENTATION

## Rollout Strategy

Our timeline is to develop our website and publish it for public use within one year.

In the first two months, we will focus on conducting market research, gathering requirements for developing our website, and applying to grants to acquire funding for our project.

Then, in the 3rd month to 8th month we will focus on reaching out to community gardens to work with us and developing our website. Furthermore, we will gather user feedback including community garden organizers, gardeners, and the City of Vancouver that we can integrate into our website. We will work closely with our users and re-iterate on the website to ensure our product is accessible and valuable.

Lastly, by the 8th month, we plan to publish our website for public use and transfer the our service to be hosted by the City of Vancouver at the end of the year.

**Step 1**
Conduct market and user research.

Gather web application requirements

Create funding proposal to City of Vancouver

**Step 3**
Develop web application

Conduct user testing with community gardens, gardeners, and City of Vancouver

**Step 5**
Publish final version of web application for general use

**2nd Month** **4th Month** **12th Month**

**1st Month** **3rd Month** **8th Month**

**Step 2**
Acquire funding from City of Vancouver

**Step 4**
Sign up community garden accounts

**Step 6**
Transfer hosting to the City of Vancouver

## Data Usage

To gather information on existing gardens, we will start off by using the public dataset on community gardens in the City of Vancouver which has information such as the garden's name, location and contact information. Then, we will reach out to the community garden organizers to work with them and integrate their data into our website.
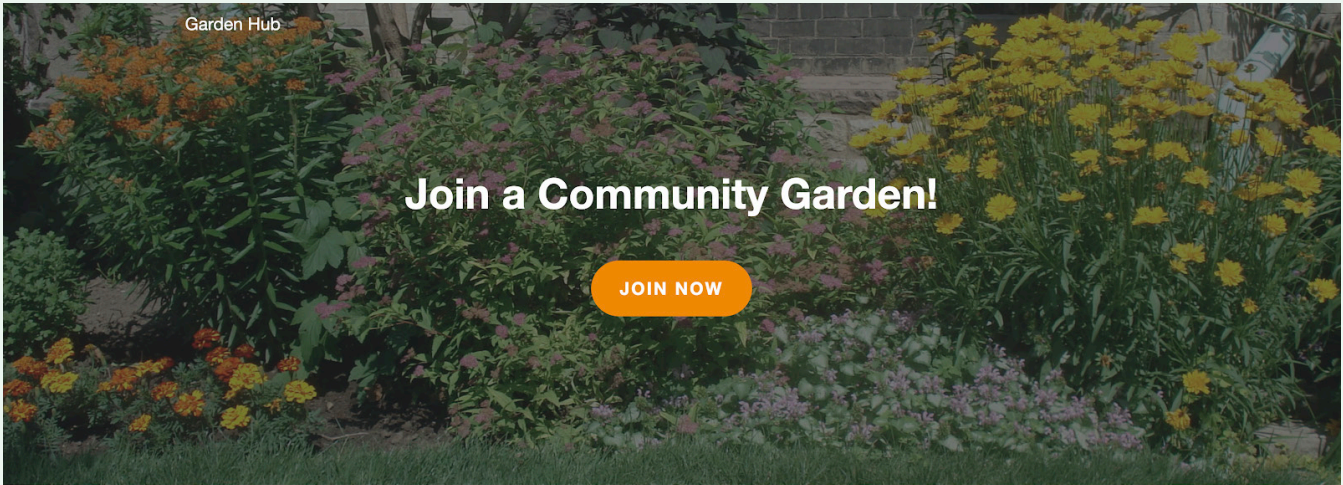
Data on gardens, garden plots, and crops within a specific plot will all be updated through our website by gardeners and community gardens. This data is available to the City of Vancouver to gain metrics and insights on how well Vancouver is doing regarding local food resilience.

## Who are our users?

Our target user is anyone who wishes to garden. This includes prospective and new gardeners who want to start gardening, whether as a hobby or to secure food. Lastly, we also encourage current gardeners to utilize our system, as it allows them to keep track and monitor their plots.

A typical user of our website would be Maya who is a 37 year old single mother who lives in an apartment in Vancouver wants to start gardening with her daughter. On a single income, Maya struggles financially with providing healthy food options for her daughter. Planting and cultivating her own fruits and vegetables would decrease her stress and anxiety and increase her food security situation. Maya has many questions about community gardening but does not know where to start. She has many questions. How do I start? Where can I garden with my daughter? Where can I locate the gardens in my community? What can I plant? How much does it cost? Is there a waitlist and how long is the wait?

**Website Prototype**

Garden Hub

# Join a Community Garden!

**JOIN NOW**

### Grow

Grow healthy vegetables and fruits locally to increase food resiliency and accessibility.

### Learn

Learn about why local food matters, how to take care of your crops, and share your food production knowledge with the community.

### Connect

Enagage with your fellow residents and interact with the community.

---

Garden Hub                                    Manage Crops    Logout

## Find a Garden

Near postal code

| V5T1E5 | ✓ |

Postal code looks good.

I want to plant: **Beets, Peppers, Potatoes**

Beets | Carrots | Cauliflower

Peppers | Potatoes | Pumpkins

Strawberries | Tomatoes

| | Type | Name | Addrress | Status | Actions |
|---|---|---|---|---|---|
| | Any / Neighbourhood / Youth | Garden Name | Address | Any | |
| 1 | Neighbourhood | Cedar Cottage Community Garden | 2021 Stainsbury Av, Vancouver BC | Waitlist (35) | View Details  Join Waitlist |
| 2 | | Cedar Cottage Community Garden - Part 2 | 2019 Stainsbury Av, Vancouver BC | Open | View Details  Join Garden |
| 3 | Neighbourhood | China Creek Community Garden | 1255 E 10th Av, Vancouver BC | Waitlist (46) | View Details  Join Waitlist |
| 4 | Youth | China Creek Housing Co-op | 1230 E 8th Av, Vancouver BC | Waitlist (51) | View Details  Join Waitlist |
| 5 | Neighbourhood | China Creek North Park | 1001 E 7th Av, Vancouver BC | Open | View Details  Join Garden |
| 6 | | City Hall expansion | 453 W 12th Av, Vancouver BC | Waitlist (35) | View Details  Join Waitlist |
| 7 | | City Hall Lawn Garden | 453 W 12th Av, Vancouver BC | Waitlist (12) | View Details  Join Waitlist |

GAR DEN HUB

# RISK ASSESSMENT

Every project is not without its barriers and risks. Increasing the access to garden waitlists could increase the wait times for a garden plot. With easier access, substantially more people could sign up for garden plots, thus only exacerbating the wait times. As a result, some community gardens might not be on board with our project. Some community gardens might not want the extra attention as well, as some of them already have well beyond 5 years of waitlist time. Therefore, gathering community support and consent from the community garden associations is critical in allowing our project to be an accurate representation of garden waitlists.

Data privacy is an issue for both the waitlist and gardener matching system as we would be holding personal data and info on the waitlist. Personal data includes their name, email and postal code, as the postal code would be useful for locating garden plots near the user. A simple solution would be the encryption of the data and for users to use a moniker or username instead of their actual names. We would not collect more personalized data such as birthdate, financial information or address.

For the matching system, there are however some uncontrollable aspects. We are only responsible for connecting the parties as such we cannot guarantee their safety or security beyond the matching process. We would provide a warning on the website that users connect with others gardeners at their own risk and to always be cautious at first meetings. One possible mitigation for safety and security would be the screening of applicants that wished to be matched.

As mentioned earlier, since community gardens currently have enough waitlist times, one pitfall would be that gathering consent and support from associations is uncertain as it might only exacerbate the wait time. In short, although our project is about increasing transparency and accessibility of the waitlists, the fact that the waitlists have long wait times means that there are already enough people signing up. This might indicate that it is not a problem of accessibility, but more a problem of demand- there simply are not enough garden plots. Therefore, our project could focus more on connecting gardeners to existing plots and to create new gardens to address this demand.

# CONCLUSION

We began by looking at the big picture of the vulnerability and resiliency of our current food system, analyzing barriers such as the unprecedented challenges of climate change, the interruption in food supply, the loss of agricultural land, and the rise of food costs. The issue we then identified that our local community garden faces are: 1) The excess amount of demands for community gardens given the limited amount of supplies, 2) The difficulty to access information regarding community garden availability, and 3) The inadequate amount of data sources to help track food production.

With the implementation of our all-in-one website, the users will be able to access the waitlists and other pertinent information about each community garden. Our platform will also facilitate the matching of individuals who don't frequently garden with those who want to learn how to, or those who would like to rent their land out. With these data collected, we will be able to seeing groupings of individuals on long waitlists and help facilitate application to new community garden sites.

In the future, we hope to incorporate the idea of enabling temporary gardens on vacant lots and vertical gardens, promoting an even more effective use of gardening lands, and facilitating more available land for people who are eagerly waiting for their opportunity to garden on the length waitlist.

GARDEN HUB

# REFERENCES

City of Vancouver. (2018). Greenest City 2020 Action Plan. City of Vancouver. Retrieved from: https://vancouver.ca/files/cov/greenest-city-action-plan-implementation-update-2017-2018.pdf

City of Vancouver. (2013). What Feeds Us: Vancouver Food Strategy, January 2013. City of Vancouver. Retrieved from: https://vancouver.ca/files/cov/vancouver-food-strategy-final.PDF

City of Vancouver Open Data Catalogue. Community Gardens and Food Trees [dataset]. City of Vancouver. Retrieved from: https://data.vancouver.ca/datacatalogue/communityGardens.htm

Metro Vancouver Climate 2050 (2018). Climate Change Data and Trends. Metro Vancouver. Retrieved from: http://www.metrovancouver.org/services/air-quality/AirQualityPublications/GlobalclimagechangetrendsevidenceAppendix2.pdf

Metro Vancouver. (2016) Climate Projections for Metro Vancouver. Metro Vancouver. Retrieved From: http://www.metrovancouver.org/services/air-quality/AirQualityPublica tions/ClimateProjectionsForMetroVancouver.pdf

Sage, C. (2014). The transition movement and food sovereignty: From local resilience to global engagement in food system transformation. Journal of Consumer Culture, 14(2), 254–275.

Tendall, D. M., Joerin, J., Kopainsky, B., Edwards, P., Shreck, A., Le, Q. B., Kruetli, P., Grant, M., & Six, J. (2015). Food system resilience: defining the concept. Global Food Security, 6, 17-23.

Community Partnership Program - Vancity. (n.d.). Retrieved April 7, 2019, from https://www.vancity.com/AboutVancity/InvestingInCommunities/Grants/CommunityPartnershipProgram/

Neighbourhood Small Grants. (2015, March 30). Retrieved April 7, 2019, from https://www.vancouverfoundation.ca/grants/neighbourhood-small-grants

Vancouver - Want To Help Improve Your Community? - SPUD.ca. (2016, March 22). Retrieved April 7, 2019, from https://about.spud.com/neighbourhood-small-grants/

Vancouver, C. of. (2016, December 23). Green grants [text/xml]. Retrieved April 7, 2019, from https://vancouver.ca/people-programs/green-grants.aspx

Vancouver, C. of. (2018, September 10). Sustainable Food Systems Grants [text/xml]. Retrieved April 7, 2019, from https://vancouver.ca/people-programs/sustainable-food-systems-grants.aspx

Wintonyk, D. (2011 April 5). Wait lists bloom as demand for city gardening grows. CTV News Vancouver. Retrieved from: https://bc.ctvnews.ca/wait-lists-bloom-as-demand-for-city-gardening-grows-1.626436