LOCAL KNOWLEDGE ABOUT JAPANESE VEGETABLES AND HERBS AMONG PEOPLE OF JAPANESE DESCENT IN SOUTHWEST BRITISH COLUMBIA

by

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ABSTRACT

There is a long history of Japanese immigration to British Columbia (BC). Eastern food knowledge is one of the cultural contributions the Japanese community made to BC. However, there is a concern that this knowledge will be lost in the Japanese communities because many of the practitioners are elders and there is little documentation of intergenerational knowledge.

The purpose of this research is to describe the traditional and modern knowledge about Japanese vegetables and herbs among Japanese home gardeners and commercial producers in Southwest BC. Traditional and modern knowledge includes aspects of production and the cultural significance of the Japanese vegetables and herbs used. The primary method of data collection was semi-structured interviews (n=12) with people of Japanese descent in the Lower Mainland and Vancouver Island, BC.

The interview participants grew more than 80 kinds of vegetables, herbs and fruit. It was common to integrate hand-powered tools, and natural and homemade products to manage soil, pests, disease and weeds.

Based on the findings, I assessed the opportunities and challenges for growing Japanese vegetables and herbs for primary production and as conduits for cultural connections. Some Japanese vegetables, such as daikon (white radish) or komatsuna (leafy vegetable) are already successfully grown within the communities and serve as a cultural connection. Also, the community network is maintained through growing and cooking these vegetables. However, challenges include our short growing season, and labor intensiveness related to production of Japanese vegetables and herbs.

This research is one step toward preserving and sharing of knowledge about Japanese vegetables and herbs, along with cultural information across generations and cultures. The result of this research is useful source for describing the local food system and will contribute an information base that should foster improved access to culturally appropriate foods.
PREFACE

This thesis is based on research conducted with the approval of the UBC Behavioral Research Ethic Board, under the certificate number H11-02019.
# TABLE OF CONTENTS

ABSTRACT ............................................................................................................................................... ii
PREFACE ............................................................................................................................................... iii
TABLE OF CONTENTS ........................................................................................................................... iv
LIST OF TABLES .................................................................................................................................... vi
LIST OF FIGURES .................................................................................................................................. vii
GLOSSARY .............................................................................................................................................. viii
ACKNOWLEDGMENTS ............................................................................................................................ x
DEDICATION ............................................................................................................................................ xi

1 INTRODUCTION ...................................................................................................................................... 1
  1.1 ACADEMIC AND PERSONAL INTERESTS TOWARD THIS RESEARCH PROJECT ............................................. 1
  1.2 OVERVIEW OF RESEARCH OBJECTIVE, DESIGN AND AUDIENCE ............................................................... 2

2 LITERATURE REVIEW OF THE JAPANESE COMMUNITY IN BC AND THE FOOD CULTURE .................................... 4
  2.1 JAPANESE COMMUNITY IN BC .................................................................................................................. 4
    2.1.1 Pre-Second World War Period ................................................................................................................ 4
    2.1.2 Post-Second World War Period and Now .............................................................................................. 6
  2.2 FOOD IN JAPANESE COMMUNITY ............................................................................................................. 8
  2.3 JAPANESE FOOD TRENDS IN BC ............................................................................................................... 9

3 PROBLEM STATEMENT, RESEARCH GOAL AND QUESTIONS ........................................................................... 10
  3.1 PROBLEM DEFINITION .................................................................................................................................. 10
    3.1.1 Food Knowledge in Japanese Communities .......................................................................................... 10
    3.1.2 Japanese Food and Local Food Systems .............................................................................................. 11
  3.2 GOAL ............................................................................................................................................................. 13
  3.3 RESEARCH QUESTIONS ................................................................................................................................ 15
  3.4 DEFINITION OF JAPANESE VEGETABLES AND HERBS IN THIS RESEARCH .................................................... 15

4 METHODOLOGY ......................................................................................................................................... 18
  4.1 OVERVIEW OF METHODOLOGY ................................................................................................................ 18
  4.2 QUALITATIVE DATA COLLECTION ............................................................................................................. 19
  4.3 INTERVIEW CONTENTS .................................................................................................................................. 19
  4.4 PARTICIPANT RECRUITMENT ..................................................................................................................... 21
  4.5 INTERVIEW PROCEDURE ............................................................................................................................ 22
  4.6 VALIDATION AND CONFIRMATION .......................................................................................................... 25
  4.7 TRANSCRIPTION .......................................................................................................................................... 25
  4.8 ANALYSIS ...................................................................................................................................................... 26
  4.9 LANGUAGE CONSIDERATIONS ................................................................................................................... 27

5 FINDINGS .................................................................................................................................................. 29
  5.1 OVERVIEW OF PARTICIPANT DEMOGRAPHICS ......................................................................................... 29
LIST OF TABLES

TABLE 1. PARTICIPANT DEMOGRAPHICS ................................................................. 30

TABLE 2. TOP 15 VEGETABLES AND HERBS RANKED BY FREQUENCY OF MENTION BY THE INTERVIEW PARTICIPANTS ................................................................. 32
LIST OF FIGURES

FIGURE 1. WEEDING TOOLS (FROM LEFT): KNIFE, WEEDING FORK, KUSAKEZURI

(TRADITIONAL JAPANESE WEEPER) AND KAMA (SICKLE). ........................................39

FIGURE 2. DAikon SPACER ..........................................................78

FIGURE 3. JUTE BAG PLANTING .................................................79
# GLOSSARY

## JAPANESE NAME, ENGLISH NAME AND BOTANICAL NAME OF JAPANESE VEGETABLES, HERBS AND PLANTS

<table>
<thead>
<tr>
<th>Japanese name (English)</th>
<th>Japanese name (Japanese)</th>
<th>English name</th>
<th>Botanical name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adzuki</td>
<td>アズキ</td>
<td>Adzuki bean</td>
<td>Vigna angularis ( Willd. ) Ohwi &amp; H.Ohashi</td>
</tr>
<tr>
<td>Asebi</td>
<td>アセビ</td>
<td>Japanese andromeda</td>
<td>Pieris japonica D.Don ex G.Don</td>
</tr>
<tr>
<td>Daikon</td>
<td>大根</td>
<td>Japanese radish</td>
<td>Raphanus sativus L. var. longipinnatus L.H.Bailey</td>
</tr>
<tr>
<td>Edamame</td>
<td>枝豆</td>
<td>Immature soybeans</td>
<td>Glycine max ( L. ) Merr.</td>
</tr>
<tr>
<td>Fuki</td>
<td>蔗</td>
<td>Butterbur</td>
<td>Petasites japonicus ( Siebold &amp; Zucc. ) Maxim.</td>
</tr>
<tr>
<td>Goya</td>
<td>ゴーヤ</td>
<td>Bitter Melon</td>
<td>Momordica charantia L.</td>
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<tr>
<td>Hotokenoza</td>
<td>ホトケノザ</td>
<td>Henbit</td>
<td>Lamium amplexicaule L.</td>
</tr>
<tr>
<td>Itadori</td>
<td>イタドリ</td>
<td>Japanese knotweed</td>
<td>Fallopia japonica ( Houtt. ) Ronse Decr.</td>
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<tr>
<td>Kabu</td>
<td>カブ</td>
<td>Turnip</td>
<td>Brassica rapa L.</td>
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<tr>
<td>Kabocha</td>
<td>カボチャ</td>
<td>Winter squash</td>
<td>Cucurbita L.</td>
</tr>
<tr>
<td>Karashina</td>
<td>カラシナ</td>
<td>Mustard greens</td>
<td>Brassica juncea ( L. ) Czern.</td>
</tr>
<tr>
<td>Komatsuna</td>
<td>コマツナ</td>
<td>Komatsuna</td>
<td>Brassica rapa L. var. perviridis L.H.Bailey</td>
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<tr>
<td>Mitsuba</td>
<td>ミツバ</td>
<td>Japanese honeywort</td>
<td>Cryptotaenia canadensis ( L. ) DC.</td>
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<tr>
<td>Mizuna</td>
<td>ミズナ</td>
<td>Mizuna</td>
<td>Brassica rapa L. var. nipposinica ( L.H.Bailey ) Kitam.</td>
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<tr>
<td>Myouga</td>
<td>ミョウガ</td>
<td>Japanese ginger</td>
<td>Zingiber mioga Roscoe</td>
</tr>
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<td>Japanese name (English)</td>
<td>Japanese name (Japanese)</td>
<td>English name</td>
<td>Botanical name</td>
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<tr>
<td>Nazuna</td>
<td>ナズナ</td>
<td>Shepherd’s purse</td>
<td><em>Capsella bursa-pastoris</em> (L.) Medik.</td>
</tr>
<tr>
<td>Rakkyo</td>
<td>ラッキョウ</td>
<td>Shallot</td>
<td><em>Allium chinense</em> G.Don</td>
</tr>
<tr>
<td>Satoimo</td>
<td>サトイモ</td>
<td>Eddoe</td>
<td><em>Colocasia esculenta</em> (L.) Schott</td>
</tr>
<tr>
<td>Shiso</td>
<td>シソ</td>
<td>Japanese basil</td>
<td><em>Perilla frutescens</em> (L.) Britton var. <em>crispa</em> Deane</td>
</tr>
<tr>
<td>Syungiku</td>
<td>春菊</td>
<td>Chrysanthemum leaves</td>
<td><em>Glebionis coronaria</em> (L.) Cass. ex Spach</td>
</tr>
<tr>
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<td>高菜</td>
<td>Takana</td>
<td><em>Brassica juncea</em> (L.) Czern.</td>
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<tr>
<td>Udo</td>
<td>ウド</td>
<td>Udo</td>
<td><em>Aralia cordata</em> Thunb.</td>
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<tr>
<td>Wasabi</td>
<td>ワサビ</td>
<td>Wasabi</td>
<td><em>Wasabia japonica</em> (Miq.) Matsum.</td>
</tr>
<tr>
<td>Yomogi</td>
<td>ヨモギ</td>
<td>Japanese mugwort</td>
<td><em>Artemisia indica</em> Willd. var. <em>maximowiczii</em> (Nakai) H.Hara</td>
</tr>
</tbody>
</table>
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I would like to express my special gratitude to my supervisor, Dr. Brent Skura, who gave me the opportunity to work on this research. I am thankful for his endless patience and guidance throughout my long journey.

I would like to thank my supervisory committee members, Dr. Gwen Chapman, Dr. Andrew Riseman and Mrs. Arzeena Hamir for their support. My research has been enriched as a result of their thoughtful and insightful suggestions.

I am grateful for my friends in Canada and Japan for their warm encouragement and friendship. I am also grateful to my sisters for supporting me and understanding my decisions.

I would like to express my deepest gratitude to my parents who have been encouraging me to explore my curiosities since I was small. It would not have been possible for me to pursue my Master’s degree in Canada without their support and understanding. I thank them for their continuous patience and encouragement.
DEDICATION

To my parents
1 INTRODUCTION

1.1 ACADEMIC AND PERSONAL INTERESTS TOWARD THIS RESEARCH PROJECT

The motive for my research comes from my academic and social experiences for the past three years. In the first year of my program, I conducted two group projects where students worked with local communities in British Columbia (BC) to improve local food security. The group projects were necessary in order to see different local food systems in BC, which are diverse in terms of food production and consumption patterns.

Along with these projects, I volunteered for a student organization at UBC, for three years. The student organization had a volunteer-run café, store, and a green box delivery program, which made local, organic and fair-trade foods accessible to the students and residents on campus. As a kitchen and green box delivery program volunteer, I developed awareness about locally based sustainable food systems within the UBC community.

In my social life, I received opportunities to participate in cultural events organized by the Japanese community in the Lower Mainland in BC. I also started to talk to a senior whose background was Japanese Canadian. My friend and I visited the senior once a week. The senior told us about his experiences in Japan and Canada. It was valuable for me to hear his stories. Through my involvement in the Japanese cultural events and conversations with the senior, I became interested in the long history of the Japanese community in BC.
Combining my interests in local food systems in BC and cultural attributes of the Japanese community, I decided to explore the stories and experiences about food production within the Japanese communities, and how food knowledge within the Japanese community could be incorporated into local food systems.

My long-term career goal is to work globally as a program planner or coordinator for designing sustainable food systems in rural communities. I want to build communities that are bound together by a common awareness of food systems that promotes social, economic and ecological sustainability.

I believe that this research will help me become a citizen, professional and future leader that cooperatively addresses key issues pertaining to the current practices of food system management and promotes sustainability.

1.2 OVERVIEW OF RESEARCH OBJECTIVE, DESIGN AND AUDIENCE

My research focuses on describing the traditional and local knowledge among home gardeners, community gardeners, and commercial gardeners of Japanese descent about Japanese vegetables and herbs in Southwest BC. Traditional and local knowledge includes Japanese vegetable production, cooking and preservation methods. The purpose of this research is to analyze the challenges and opportunities for growing Japanese vegetables for commercial and home use in the Lower Mainland and Vancouver Island regions of BC. This study explores how and why the local Japanese communities grow vegetables and herbs. The primary methods of data collection are personal
interviews with the Japanese Canadians who grow Japanese vegetables and herbs in the Lower Mainland and Vancouver Island regions of BC.

I hope that this research will contribute to further documentation and development of food cultures that Japanese communities have passed on through generations. I also hope that the research will acquaint people with Japanese food culture, regardless of consumers’ cultural backgrounds. Furthermore, this research explores prospects of not only Japanese food but also other ethnic foods that could be incorporated into local food systems in BC. I believe that this research will be a beneficial component toward future modeling of the local food system and should contribute to improved access to culturally appropriate foods.
2 LITERATURE REVIEW OF THE JAPANESE COMMUNITY IN BC AND THE FOOD CULTURE

2.1 JAPANESE COMMUNITY IN BC

2.1.1 Pre-Second World War Period

There is a long history of Japanese immigration to BC. The first immigrant from Japan came to BC in 1877. Since then, Japanese communities have grown rapidly in BC. The early Japanese immigrants were temporary migrant workers who dreamed of making their fortunes and then returning to Japan. In 1908, the entry of male immigrants was limited because of the agreement regarding restriction of Japanese immigration between the governments of Canada and Japan. However, the agreement did not limit entry of female immigrants. Married male immigrants sent for their wives from Japan. Many Japanese females immigrated to Canada through “shasin kekkon”, or picture bride. Picture bride was an arranged marriage system; a picture was used to introduce a prospective bride to a single immigrant man in Canada. The arrival of Japanese wives and brides changed the aspirations of the early immigrants. Their dream shifted from seeking their fortunes in order to return to their homeland to raising their families in Canada (Smedman, 2009; Yesaki, 2003).

There was a vibrant Japanese community in the Lower Mainland before the Second World War (WW2). Japanese communities developed their own social, religious and economic institutions. Vancouver had the largest Japanese community in BC, and even had Japan town around Powell Street. Powell Street was a capital of the Japanese community in BC. The Japanese operated stores,
pharmacies, doctors’ and midwives’ offices, tax companies, banks, tofu (bean curd) factories, rooming houses, hotels, department stores, schools, bathhouses, Buddhist and Christian Churches. The number of Japanese increased in Richmond as the jobs for cannery laborers, fishermen and other related businesses grew. There were hospitals, language schools, kindergartens, Buddhist Temples, United Churches and fishery cooperatives. In Steveston, the area of south Richmond, more than a half of the population consisted of Japanese before WW2 (Carter, Kobayashi, Kawamoto & Japanese Canadian National Museum, 2011; Izumi, 2005; Smedman, 2009; Yesaki, 2003).

Many Japanese immigrants who settled in the Lower Mainland found employment opportunities in the fishing industry. Japanese immigrants fished for canneries on the coast. Since small fishing boats and charcoal were important for fishing, they also created jobs in the small boat building and charcoal production industries. Japanese immigrants initiated the salt chum salmon and herring industries. There was a big market for salted chum salmon and herring in East Asia. Japanese immigrants salted chum salmon and herring and exported the products to Japan, China, Taiwan and Korea. Agriculture was also a major industry for Japanese immigrants. Japanese immigrants converted forests into farmland along the Fraser River between Surrey and Mission. Some of Japanese immigrants had farming experiences in Japan. However, Canada is located further north than Japan, and it was a struggle for them to find appropriate land for farming. They grew strawberries and raspberries for commercial use. Japanese Canadians dominated the berry industry by the late 1930’s. Japanese
women were employed by the local berry and vegetable farms during harvest season (Ayukawa, 2005; Miki, Kobayashi, & National Association of Japanese Canadians, 1991; Nabata et al., 1996; Yesaki, 2003).

During the WW2, members of Japanese communities in BC were forcibly scattered across Canada because the Canadian government decided to evacuate all Japanese from the Pacific Northwest. Although some Japanese Canadians went back to Japan, most of them moved to other provinces or the interior of BC. Japanese volunteer workers pursued road construction, and firewood and pulpwood cutting in Ontario. Japanese Canadians also worked on sugar beet farms in Alberta. There were internment camps in the interior of BC, where many Japanese Canadian families stayed until the end of the evacuation policy (Yesaki, 2003).

2.1.2 Post-Second World War Period and Now

In 1949, the Japanese evacuation policy was rescinded. Although most Japanese Canadians remained in Ontario, Alberta and the areas near the camps, some returned to the BC coast. Since all the properties of Japanese Canadians were seized during WW2, resettlement was difficult. However, Japanese Canadians resumed living and working along the BC coast. Japanese communities were rebuilt. Compared to the pre-war era, postwar Japanese communities are scattered; there are no big Japanese communities near Powell Street or in Steveston. However, the culture that Japanese immigrants brought and developed has remained (Sunahara & Oikawa, n.d.; Yesaki, 2003).
According to the 2006 Census of Canada, there were 81,300 Canadians of Japanese origin (Statistics Canada, 2009). Canadians of Japanese origin made up the tenth largest non-European ethnic group in the country, after South Asian, Chinese, Black, Filipino, Latin American, Arabian, Southeast Asian, West Asian, and Korean. Canadians of Japanese origin represented 1.6% of the visible minority population (Statistic Canada, 2008).

According to Lindsey (2007), Canadians of Japanese origin included:

- Canadian citizens (by birth or by naturalization) and
- Landed immigrants with a usual place of residence in Canada,
- Residents in Canada who are claiming refugee status and members of their families living with them
- Residents in Canada who hold: a student authorization, an employment authorization, a Minister’s permit, and members of their families living with them.

The Japanese community in Canada is growing. Between 1996 and 2001, there was an 11% increase of people of Japanese origins. Seventy seven percent of the Japanese community was born in Canada while 23% of the Japanese community were born outside of the country, and 44% of the foreign-born Canadians of Japanese origin had arrived relatively recently: between 1991 and 2001 (Lindsey, 2007).

British Columbia has the largest Japanese population in Canada that accounted for about 1% of the total population in BC. The city of Vancouver is
one of the cities where the majority of Canadians of Japanese origin reside (Lindsey, 2007).

2.2 FOOD IN JAPANESE COMMUNITY

Japanese foodways, one of the cultural attributes that Japanese Canadians contributed to BC, have become incorporated into local food consumption patterns. Although the early Japanese immigrants adapted the culture and lifestyle of their homelands to Canada, they continued to practice traditional food customs. Rice, miso (fermented soy bean paste) soup, vegetables and fish were important staple dishes that accompanied every meal. Their main dishes were prepared based on dried and fresh vegetables. Commonly used dried vegetables were daikon (Japanese radish: see Appendix B) roots and taro leaves and roots. Seaweed and tofu were significant dried ingredients. They used the local fresh vegetables, such as potatoes, carrots, onions and cabbages, for the Japanese style diet. Pearl rice, one of the most important staples of the Japanese diet, was imported, and fish were easily accessible along the BC coast. Japanese merchants in Vancouver manufactured Japanese noodle, tofu, kamaboko (fishcakes) and condiments, including shoyu (soy sauce) and miso. There were also confectionary stores that sold Japanese sweets, such as manju (bun with red bean paste filling) and mochi (glutinous rice cake) (Carter, Kobayashi, Kawamoto & Japanese Canadian National Museum, 2011; Yesaki, 2003).
Growing food in small gardens was common in the Japanese community. Japanese homemakers grew common local and oriental vegetables. They also grew exotic plants, such as shiso (Japanese basil), fuki (butterbur) (see Appendix B), Asian burdock and ichinen-cha (herbal tea). Growing food was important for the Japanese community to practice food customs and to reduce household expenses (Yesaki, 2003).

2.3 JAPANESE FOOD TRENDS IN BC

In recent years, Japanese food has been introduced to Canadian and other ethnic communities. Many restaurants serve Japanese cuisine, such as sushi (rice with raw fish), tempura (deep fried vegetables or seafood) and udon (white wheat noodle). Local grocery stores sell ingredients and seasonings for Japanese cuisine, such as tofu, nori (dried seaweeds), and syouyu (soy sauce). In addition, along with the growing popularity of similar Asian vegetables, Japanese vegetables have become recognized by Canadian and other ethnic communities. Vegetable names that originated from the Japanese language, for example, kabocha (winter squash: see Appendix B) and daikon, are commonly used in the Canadian market place.

From my personal experiences in Vancouver for the past few years, I have noticed that most Japanese vegetables are imported into Canada, especially from Asian countries and the United States. However, some Japanese vegetables and herbs are grown and distributed to local consumers in BC.
3 PROBLEM STATEMENT, RESEARCH GOAL AND QUESTIONS

3.1 PROBLEM DEFINITION

3.1.1 Food Knowledge in Japanese Communities

As mentioned in the literature review, there is a long history of Japanese communities in BC. In the long history, there is a record of members of Japanese communities in BC growing Japanese vegetables and herbs and connecting with food practices that they brought from their home country. However, there is a concern regarding documentation, preservation and transfer of food knowledge and practices within the Japanese communities (field note, January 27, 2011).

Before officially starting this study, I had opportunities to talk to some people in Japanese communities. From the conversations with them, I was made aware of a concern that knowledge about farming and gardening activities within the Japanese communities will be lost. Food knowledge and practices will likely not exist in the future if the knowledge and practices used by gardeners, community gardeners and farmers are not preserved and disseminated.

There are some reasons for the concern. First, compared to the past, there are not many Japanese commercial farmers in BC. Farmers retired and sold their farms for land development because young people did not take over the farms (field note, November 5, 2011). Second, there appears to be a lack of communication of food knowledge among generations. Elders are actively involved in gardening, exchanging their produce, and cooking within the
Japanese communities (field note, November 6, 2010). The elders are more knowledgeable about food production and preservation than younger generations. However, there are not many opportunities for intergenerational learning. Although some members of younger generations have recently become interested in gardening, most of them do not know how to start gardening, and where/who they can ask about growing food (field note, October 22, 2011).

3.1.2 Japanese Food and Local Food Systems

As consumers in BC become aware of food, health and environmental issues, they are beginning to pay more attention to questions like “where does my food come from?” and “by whom and how is my food grown?” The consumers have become interested in local, healthy and nutritious food in their communities (Metro Vancouver, 2011).

These attitudes are also reflected in ethnic markets. According to “Canadian Food Trends to 2020 – A Long Range Consumption Outlook” prepared by Serecon Management Consulting Inc. (2005), Canadians are increasingly exposed to ethnic foods. Food ingredients, cooking methods and presentation styles brought by immigrants influenced food patterns.

BC has a cultural diversity and the highest proportion of visible minorities among all provinces and territories in Canada (Ministry of Attorney General and Minister Responsible for Multiculturalism, 2008). In BC, visible minorities represent 24.8% of its population, and the proportion is growing. In particular, Metropolitan Vancouver has a large population of visible minorities that accounts
for 65.1% in Richmond, 55.4% in Burnaby and 51.0% of the residents in the City of Vancouver.

Considering the biggest population of visible minorities in Canada, BC has a bigger ethnic market than other provinces and territories in Canada. This also implies that the consumers in BC, especially in Metropolitan Vancouver, have more opportunities to have ethnic food experiences than other regions in Canada.

There is an emerging interest in how ethnic foods could fit into the local food systems. In fact, the Regional Food System Strategy that was adopted in Metro Vancouver in 2011 declared the importance of better access to culturally appropriate food (Metro Vancouver, 2011). However, contrary to the growing popularity of ethnic foods and emerging interests in local food systems, ethnic food is not fully included in the local food movements (Gibb, 2011). From my observation, ethnic foods are heavily dependent on imported ingredients. Also, there are not many academic resources about food knowledge in ethnic communities in BC.

These facts are also true for Japanese food. From my observation in local stores and markets, Japanese foods depend on imported ingredients. There is a limited supply of locally grown or produced ingredients for Japanese foods. In addition to that, there are not many resources and data on food production and consumption within the Japanese communities in BC.

Considering the concern about the impending loss of food knowledge within the Japanese communities, and the disconnection between the Japanese
communities and local food movements, it is important to document the techniques and knowledge of food production within the Japanese communities in BC. Information about food production techniques and knowledge should be stored and passed on to future generations. Food knowledge should also be shared with people beyond the Japanese communities and integrated into local food movements.

3.2 GOAL

The goal for this research was to gather knowledge about growing Japanese vegetables and herbs within the Japanese communities in the Lower Mainland and on the Vancouver Island in BC. The keys for exploring food knowledge within the Japanese communities could be learned from the Japanese farmers and home and community gardeners. This research explored how members of Japanese communities grow vegetables and herbs locally with an emphasis on the production techniques. This research also identified the strengths and weaknesses pertaining to producing vegetables by home gardeners, community gardeners and commercial growers, and assessed priorities to improve local Japanese vegetable and herb production. In addition, cultural significance of Japanese vegetables and herbs within the cultural practices of people of Japanese descent was documented.

The outcome of this research could be a compilation of information and knowledge about growing Japanese vegetables and herbs locally. The information and the knowledge would be useful for the following three audiences:
the Japanese community in BC, people who are interested in growing Japanese vegetables and herbs, and community planners.

First, I hope that this research contributes to further development of food cultures that Japanese communities have passed on through generations. Seniors are more familiar with gardening, cooking and cultural cerebration in the Japanese communities. The outcome of this research could be a resource for intergenerational learning.

Second, I hope that this research acquaints people with Japanese food culture, regardless of consumers’ cultural backgrounds. Compared to before, more people have become interested in growing and eating Japanese vegetables and herbs (A.Hamir, personal communication Dec.1, 2010). The outcome of this research includes advice on growing Japanese vegetables and herbs. This research could be used for beginning gardeners regardless of their cultural backgrounds.

Third, this research explores prospects of not only Japanese food but also other ethnic foods. The information and knowledge collected in this research should be useful for community planners to create strategies for bringing ethnic food knowledge into local food movements. This research could provide ideas on how to model local food systems that ensure the coexistence of diverse ethnic foods and better access to culturally appropriate foods.

Overall, most importantly the University is in a position to generate, preserve and disseminate knowledge. This is the first study analyzing local food
knowledge within the Japanese communities in BC, and creates a fundamental academic source documenting food production techniques and practices within the Japanese communities. Also, this study should draw interests from multiple community stakeholders as they explore theoretical and practical approaches to improve local food production.

3.3 RESEARCH QUESTIONS

The research questions can be summarized as follows:

- What practices are people of Japanese descent using when growing Japanese vegetables within the Japanese community?
  - What kinds of vegetables and herbs do the communities grow?
  - What kinds of techniques do the communities use to grow vegetable and herbs?
- What are the challenges and opportunities for growing Japanese vegetables and herbs in terms of social and environmental factors?
- What advice would I give to the communities and new gardeners?

3.4 DEFINITION OF JAPANESE VEGETABLES AND HERBS IN THIS RESEARCH

I looked up books and online resources, and found that Japanese vegetables, fruits and herbs were defined in different ways. Although the numbers could be different depending on plant scientists and horticulture scientists, Japanese people consume more than a hundred varieties of vegetables (Watanabe, 1997).
According to Aoba (1997), vegetables and fruits that are commonly consumed in Japan can be sorted into:

- Vegetables and fruits from all over the world via China, such as eggplant and daikon.
- Wild plants originally from Japan that have been domesticated, such as udo and wasabi (see Appendix B).
- Weeds accompanying imported crops and domesticated in Japan, such as nazuna (shepherd’s purse) and hotokenoza (henbit) (see Appendix B).

In these categories, a very small number of vegetables and fruits are originally from Japan. Most of the vegetables and fruits often seen at the Japanese table originally came from all over the world via China, the Korean peninsula or Southeast Asia. According to Watanabe (1997), examples of vegetables native to Japan are udo, mitsuba (Japanese honeywort), myouga (Japanese ginger), fuki, and wasabi (see Appendix B).

By early tenth century, daikon, satoimo (eddoe), green onion, turnip, shiso, chive, garlic, ginger, lotus root, adzuki (adzuki beans), cowpeas, eggplant, cucumber, takana (leaf mustard), and rakkyo (shallot) were introduced to Japan, and commonly consumed by Japanese (Watanabe, 1997) (see Appendix B). By nineteenth century, carrot, burdock, sweet potato, hot pepper, spinach, syungiku (chrysanthemum leaf), cabbage, corn, and kabocha (Japanese kabocha) were introduced to Japan (Watanabe, 1997) (see Appendix B).
In the late nineteen-century, many vegetables and fruits were introduced to Japan from abroad. It is because Japan opened its door to foreign countries. The Japanese government tried to absorb the culture of other countries. It was encouraged by the government to grow new vegetables from Western countries or China (Aoba & Hirayama, 1988). Tomato, strawberry, potato, onion, and asparagus were some examples that came to Japan from abroad in the late nineteen century (Watanabe, 1997).

Thus, the definition of Japanese vegetables, herbs and fruits is different depending on how a person views the historical background of vegetables, herbs and fruits commonly eaten in Japan. In this research, Japanese vegetables and herbs mean ones that:

- are native to Japan,
- have commonly used Japanese names,
- are called “Japanese…..(vegetables or herbs name)”, and
- are grown from seeds originally from Japan.
4 METHODOLOGY

4.1 OVERVIEW OF METHODOLOGY


The major purpose of this research project was to describe situations and events pertaining to gardening and farming within Japanese communities in the Lower Mainland and Vancouver Island in BC. This research was guided by a qualitative research approach because an in-depth understanding of people’s activities and experiences was more important than generalization of findings. Qualitative data could be used for describing and telling a story (Patton, 2002). In this research, gardening and farming techniques and the attitudes about growing vegetables and herbs within the communities were considered as qualitative data.

Personal in-depth interviews based on semi-structured questions were the primary methods of qualitative data collection. However, direct participation in and observation of the phenomenon can also be a source of qualitative data (Patton, 2002). For this research project, my participation in and observation of the Japanese communities were necessary to gain more familiarity with herb and vegetable production as well as to gain more insight into the challenges and opportunities faced by commercial farmers and gardeners. For example, I participated in Japanese community events interacting with the participants. I
also spent a number of weeks at commercial farms gaining hands-on experiences and understanding relationships between the producers and consumers. I took field notes to record my experiences through the observation and participation in various events and activities.

**4.2 QUALITATIVE DATA COLLECTION**

The personal in-depth interviews were conducted with people of Japanese descent who grew Japanese vegetables and herbs as home gardeners, community gardeners or commercial farmers in the Lower Mainland and Vancouver Island. In-depth interviews consisted of less structured and open-ended questions; this method offers more flexibility to guide the flow of interviews (Babbie and Benaquisto, 2002). I used semi-structured questions in order to gain descriptive answers to my research questions. The semi-structured questions also allowed me to learn about different aspects of my research topic and to explore my research questions in more depth with each of the participants.

**4.3 INTERVIEW CONTENTS**

Since no similar research had been conducted before with Japanese people involved in production of Japanese vegetables and herbs, I was uncertain about the number of people in the current Japanese communities in the Lower Mainland and on Vancouver Island in BC are and what their food related activities look like. The first phase of my study was to pay visits to Japanese community events and Japanese local supermarkets, and to talk informally to my friends and people who have experience with gardening or farming in BC. The
informal visits to the local Japanese communities gave me a better understanding of the local Japanese communities in the Lower Mainland in BC. During my visits to the communities, I also heard from members of the Japanese communities about their cultural values pertaining to food production.

Based on the information and ideas that I collected from my visits to the communities, I created semi-structured questions focusing on food production for home, commercial and cultural uses within the Japanese communities (see Appendix A: Questionnaire Template). The interview questions were developed in order to enable gathering of stories about farming and gardening within the Japanese communities. The questions were also designed to enable assessment of challenges and opportunities for food production within the Japanese communities, and major improvements desired by members of the communities.

The interview was tested by different subjects and reviewed by my academic supervisor, Dr. Brent Skura, and my research committee for the possibility of bias. This survey also needed to be approved by a UBC-affiliated Research Ethics Board (REB). Before the application for the REB approval, I completed the Introductory Tutorial for the Tri-Council Policy Statement (TCPS2): *Ethical Conduct for Research Involving Humans* (Government of Canada, 2013). All documents for the REB application, such as the consent form, interview script (see Appendix A) and letter of initial contact were prepared in English and in Japanese.
4.4 PARTICIPANT RECRUITMENT

The objective of my research project was to gain a deeper understanding about vegetable and herb production in the Japanese communities. Recruitment of participants was purposive through the use of key informants. A key informant is a member of a group who is familiar with the group and might be willing to connect a researcher with potential participants (Babbie and Benaquisto, 2002).

As I talked to my friends or people at the Japanese community events, I felt the need to identify key criteria for recruiting interview participants. I made three key criteria for recruiting interview participants. 1) People of Japanese descent: people who consider Japanese as the only ethnic or cultural group of their ancestors, and people who consider not only Japanese but also other ethnic and cultural group as their origins. 2) Home gardeners, community gardeners and commercial farmers who grow Japanese vegetables and herbs in the Lower Mainland or Vancouver Island in BC. 3) Home gardeners, community gardeners and commercial farmers who have been gardening or farming for more than 5 years.

First, I sent an email message to Japanese communities, such as Tonarigumi (Japanese Community Volunteers Association), Nikkei Place (National Nikkei Museum & Heritage Centre), Tokyo University of Agriculture Alumni in Canada, and Richmond Food Society. Key informants for my research project were knowledgeable in the history, culture and food/agriculture-related activities in the Lower Mainland in BC. I requested them to introduce me to
people who grow Japanese herbs and vegetables and who might be willing to participate in this research project. I also informally talked to friends who know commercial farmers and home gardeners within the Japanese community in the Lower Mainland and Vancouver Island in BC. They introduced me to commercial farmers or gardeners who might be interested in this research project. I also attended an annual Japanese farmers market in Nikkei Centre in Burnaby and informally talked to the organizers and farmers.

4.5 INTERVIEW PROCEDURE

Each interview took approximately 45-90 minutes. Participants included home gardeners, community gardeners and commercial growers. Sample size for qualitative data collection depends on the purpose of the study, the quality of the data, and available time and resources (Patton, 2002). Thus, there were two considerations that I took into account when I decided how many people I would interview. First of all I had to consider the number of interviews required to enable me to gain a better understanding of the communities and to answer the research questions. The goal of this project was to develop a better understanding about gardening and farming practices in the Japanese communities in the Lower Mainland and on Vancouver Island in BC. The sampling size should have been purposive; richness of the information and knowledge from the interview participants were key requirements to answer the research questions.
Second, I had to consider my research timeline and my capacity for traveling. I used public transportation to travel to the interview sites. The Interview sites covered a large area, including in the Lower Mainland and on Vancouver Island. Almost none of them lived close to each other. Also, I needed to visit each participant twice to do the initial interview and follow-up interview. It was important to be aware of the limitations imposed by the research timeline and my capacity for traveling by public transportation.

After informal email and telephone inquiries and personal interviews, I got to know that people in the Japanese communities were knowledgeable about growing plants and cooking, and had valuable stories. However, I also found that some people in the communities, especially gardeners, did not regard themselves as potential participants. They were unwilling to participate in this project, saying that the production scale of their gardens was small. Furthermore, I found that there were not many commercial farmers of Japanese descent in the Lower Mainland and on Vancouver Island. Considering these facts and my research timeline, I decided that the practical number of the interviews was between 10 and 15.

I brought closure to the participant recruitment when I got sufficient information to explore the research questions and found similar insights being generated. The number of interviews was 12 (three commercial gardeners, three community gardeners and six home gardeners). For two of the interviews, two people presented together and both of them participated in the interview. The interview questions were about vegetable and herb production, marketing, as
well as home and cultural use of Japanese vegetables and herbs.

I brought the questionnaire template (see Appendix A) to each of the interviews. However, the interviews were conversational in style. The order of the questions was flexible, and I allowed the participants some freedom to pursue topics. I used the questionnaire template to make sure that all of the specific topics were covered.

In order to choose how to record interviews, it is important to consider the circumstances of each interview (Rubin and Rubin, 1995). I chose to use a digital recorder or handwritten notes depending on the level of comfort of each interviewee and the degree to which the interviews could affect a third person or the situation. If participants agreed and I found it appropriate to use a digital recorder, the interview was recorded electronically. If participants preferred not having the interview recorded or I found it inappropriate to use a digital recorder, the interview was not recorded electronically. In my research, interviews were not necessarily in sit-down settings. For example, some interviews were conducted when the participants were working in their garden or at community events, or having a picnic with their family and friends.

Most of the participants were fluent in Japanese and English. The interviews were conducted in English and/or Japanese depending on the participant's preference. For all the interviews, I took notes during the interviews. Following the interview process, the recording of the interview was transcribed. When the participants spoke in Japanese, I transcribed that part of the interview
in Japanese and then translated the written Japanese into English.

4.6 VALIDATION AND CONFIRMATION

This research project was based on stories from members of the Japanese communities. Since it was important to corroborate real meaning of the collected data, I scheduled a follow-up informal meeting that lasted approximately one hour. Prior to the follow-up meeting, I prepared a summary of the interview transcription and a list of follow-up questions that I was going to ask for validation and confirmation. In the conversation with each participant, I explained the summary, and asked follow-up questions. If there was a misunderstanding between the participant(s) and me, I made changes to my field note. I also outlined which parts, if any, of the interview transcription that he/she did not want to disclose to the public.

4.7 TRANSCRIPTION

I transcribed each interview shortly after I completed the interview. When the participants and I spoke Japanese during the interview, I made the transcriptions in Japanese, and then translated them into English.

In the transcription, there was a space available for my thoughts or upcoming questions. I used these thoughts and questions for a follow-up informal meeting with each participant. I added more notes into the transcription after the follow-up meeting.
4.8 ANALYSIS

Although computer software is available for qualitative data analysis, hand coding was used in this study. Since the number of the interview participants was less than 15; the collected data from them was manageable without computer software. In addition, in this research, data were collected in both English and Japanese; some ideas and comments cannot be directly translated. I occasionally used Japanese words as keywords to find emerging themes. Furthermore, I personally preferred physical copies of the collected data for organizing and grouping the data. I found it easy for me to print the data or to write them on the paper, and cut and paste according to keywords or themes. Thus, I concluded that hand coding was suitable for the current project.

Along with the interview transcripts, the field notes from my participation in and observation of the Japanese communities were important for the data analysis. I read the physical copies of transcriptions and the field notes over and over to familiarize myself with the collected data. I made margin notes where I wrote common or unexpected themes and findings. After the first assessment of data, I re-read the entire data and margin notes to identify relevant themes. I also wrote down patterns or comparisons of the concepts as I found them from the collected data.

The key words, themes and concepts from the collected data were sorted under three categories: production techniques, use of produce; attitudes and perspectives about food production. I analyzed key words to identify the
challenges and opportunities for growing Japanese vegetables and herbs. Implications for future research, practice and policy were also explored based upon the key words, themes and concepts. In order to avoid the possibility of my bias, my academic supervisor and my research committee reviewed the key words, major themes and concepts a few times during analysis of the meaning of the collected data.

In the analysis process, it was important to protect the participants' confidentiality. All information from the participants was anonymous; I simply used “a participant”, “a commercial farmer”, “a home gardener” or “a community gardener” where I referred to the data from them so that the participants cannot be identified.

**4.9 LANGUAGE CONSIDERATIONS**

Most of the interview participants were bilingual. They spoke both Japanese and English well. It was very important to understand both English and Japanese well when I invited the Japanese communities to participate. I am from Japan, and speak both Japanese and English. In this research, all documents for participants, such as letter of advertisement, initial contact and consent forms, were prepared in both English and Japanese. Interviews were conducted in English and/or Japanese depending on the participant’s language preference.

As I mentioned before, some words and ideas could not be directly translated. It was important to be aware that there was a limitation of the extent of data interpretation between different languages. Also, in this thesis, some words
were written in Japanese, such as *daikon* (white radish) or *bokashi* (partially fermented organic matter). There were two cases that I decided to use Japanese words. The first case was for Japanese words that were well known in Canada. The second case was for Japanese words for which I could not find appropriate translation. However, for both cases, English translations were available in a bracket in the text of this thesis or Appendix B.
5 FINDINGS

5.1 OVERVIEW OF PARTICIPANT DEMOGRAPHICS

The interview sites encompassed the Lower Mainland and Vancouver Island in BC (Table 1). The total number of the interviews was 12. The participants were sorted into three groups: commercial farmers, community gardeners and home gardeners. The interviews consisted of three interviews with commercial farmers, six with home gardeners and three with community gardeners. Two of the farmers who participated in these interviews, were practicing organic farming with one having an organic certification. In total, there were 14 participants since two different people showed up for each of two interviews. When two people participated in an interview together, the participants were treated as one participant as they were producing vegetables and herbs on the same land. There were nine female and five male participants. Their age ranged from 30s to 80s.

None of the interview participants grew up in the Lower Mainland and Vancouver Island in BC. One participant was born and grew up in the southern interior of BC. Other participants were born in Japan and immigrated to Canada. Their hometowns were various regions of Japan. The participants who grew up in Japan have been living in Canada for 15 to 55 years. Their farming and gardening experiences in Canada ranged from six to 51 years. Some participants had long term experiences of gardening or farming in Japan or other places in Canada before they started a garden or farm in BC.
Table 1. Participant Demographics

<table>
<thead>
<tr>
<th>Number interviews</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>5 interviews in Richmond</td>
</tr>
<tr>
<td></td>
<td>2 interviews in each of Burnaby and Victoria area</td>
</tr>
<tr>
<td></td>
<td>1 interview in each of Abbotsford, Surrey, and Vancouver</td>
</tr>
<tr>
<td>Number of participants</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>4 commercial farmers</td>
</tr>
<tr>
<td></td>
<td>7 home gardeners</td>
</tr>
<tr>
<td></td>
<td>3 community gardeners</td>
</tr>
<tr>
<td>Gender</td>
<td>Female 9 : Male 5</td>
</tr>
<tr>
<td>Age</td>
<td>30s to 80s</td>
</tr>
</tbody>
</table>

The average size of the commercial farms in this project was 1.9 hectares (4.7 acres). Two of the commercial farmers said that their farmland would be considered very small in Canada. The average size of a farm in Canada is 316.2 hectares (778 acres) (Statistics Canada, 2012). The plot size of all community gardeners were almost the same. The average size of a plot in the community garden was 21m². The size of home gardens varied from 28m² to 4064.8m² (one acre). The participants who live in or close to Vancouver had smaller home gardens compared to those who live far from Vancouver.

5.2 PRODUCTION TECHNIQUES

This section focuses on what and how the participants grow vegetables and
herbs and highlights production techniques, such as soil amendments and pest management.

5.2.1 Vegetables and Herbs

The participants grew many kinds of vegetables and herbs. The vegetables and herbs were listed by frequency of being mentioned by the interview participants (Table 2). The frequency was calculated as number of participants who reported growing the vegetable. Further explanation of Japanese vegetables and herbs listed in Table 2 is available in Appendix B.

Overall, daikon, fuki, kabu, shiso and komatsuna were the common Japanese vegetables grown among the participants. However, all of the farmers and gardeners interviewed cultivated not only Japanese vegetables but also western vegetables and other Asian vegetables.

Ten out of the 12 participants grew daikon. Most of them said that it was easy to grow daikon during summer in the Lower Mainland and on Vancouver Island because of the cool weather. Some of the participants found it beneficial to grow daikon for whole summer in the Lower Mainland and on Vancouver Island because daikon cannot be grown in summer in Japan due to the hot and humid weather.

Nine out of the 12 participants grew fuki, kabu and shiso. There were two kinds of shiso grown by the participants: green and red shiso. All of the nine participants grew green shiso; however, some of them cultivated red shiso as well.
Eight out of the 12 participants grew cucumber, komatsuna, lettuce and zucchini. Some of them mentioned that they preferred Japanese cucumber, which has a long and thin shape. Komatsuna is a leafy vegetable famous in Japan. Although the leaves are green in general, some of the participants said that they also grew red komatsuna that has dark red leaves. Most of the

### Table 2. Top 15 vegetables and herbs ranked by frequency of mention by the interview participants

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Vegetables and herbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 participants</td>
<td>Daikon (white radish)</td>
</tr>
<tr>
<td>9 participants</td>
<td>Fuki (butterbur)</td>
</tr>
<tr>
<td></td>
<td>Kabu (turnip)</td>
</tr>
<tr>
<td></td>
<td>Shiso (Japanese basil)</td>
</tr>
<tr>
<td>8 participants</td>
<td>Cucumber</td>
</tr>
<tr>
<td></td>
<td>Komatsuna</td>
</tr>
<tr>
<td></td>
<td>Lettuce</td>
</tr>
<tr>
<td></td>
<td>Zucchini</td>
</tr>
<tr>
<td>7 participants</td>
<td>Cabbage</td>
</tr>
<tr>
<td></td>
<td>Mizuna</td>
</tr>
<tr>
<td></td>
<td>Spinach</td>
</tr>
<tr>
<td></td>
<td>Tomato</td>
</tr>
<tr>
<td>6 participants</td>
<td>Eggplant</td>
</tr>
<tr>
<td></td>
<td>Kabocha (Squash)</td>
</tr>
<tr>
<td></td>
<td>Kale</td>
</tr>
</tbody>
</table>
participants said that it was easy to grow green and red komatsuna. According to the participants, the flavor of green and red komatsuna is the same. The participants grew various kinds of zucchinis, such as Korean zucchini that has pale green skin.

Seven out of the 12 participants grew cabbage, mizuna, spinach and tomato. Mizuna is a green vegetable that has tall and thin leaves with a crisp texture. Six out of the 12 participants grew eggplant, kabocha and kale.

Along with vegetables and herbs, most of the participants grew fruit and flowers, such as apple or dahlia.

5.2.2 Growing Season

Growing season was generally limited to summer for most home gardeners, community gardeners and commercial farmers. Only one commercial farmer and two community gardeners grew vegetables all year round. Throughout the year, the commercial farmer produced most of the vegetables in greenhouses. The greenhouses did not have a heating system; however, the greenhouses protected plants from cold and rain in winter. The farmer said that year round production was possible because of the greenhouses. The community gardeners did not have greenhouses or cold frames; however, they grew kale, cauliflower and some other leafy vegetables in their plots during winter.

All of the home gardeners and community gardeners along with other commercial farmers cultivated vegetables, herbs and fruits from spring to late fall. Most of them said that they started preparing soil and sowing in April and finished
harvesting by November. The main hindrance for growing vegetables in winter was frost. The participants said that frost started in October or November in the Lower Mainland and on Vancouver Island in BC. One participant explained: "when frost occurs in fall, plants get white mold easily." Frost is also observed in spring. One participant mentioned; “frost in early spring damages seedlings or young plants. It is important to keep eyes on temperature during planting time in spring.”

5.2.3 Seed

There was a long tradition of using seeds of heritage varieties. The seeds of heritage varieties were from earlier Japanese immigrants. Some participants knew that the Japanese immigrants in the early 20th century had brought many kinds of vegetables, fruit and herbs. Although most of the participants were the first generation Japanese who immigrated to Canada, some of their plants were from the earlier Japanese immigrants whom they might never have met. The plants from the earlier immigrants are still available because the seeds or young plants have been passed on within the Japanese communities. For example, one home gardener stored some seeds, such as Japanese yum and kiku (chrysanthemum), from his grandfather who owned a farm in the southern interior of BC.

One of the participants shared a story about plants from the earlier Japanese immigrants. The participant had some vegetables from the earlier Japanese immigrants, and found a unique thing about heritage varieties, saying: “seeds from the first or second immigrant generations were stronger than new
seeds. It was easier to store the seeds from the earlier generations than the ones from local stores."

Many participants bought seeds at local seeds stores. For example, three community gardeners also bought seeds from West Coast Seeds. I had visited the West Coast Seeds store with the community gardeners and found Japanese vegetable seeds, such as mizuna or daikon. In addition, some of the participants bought Asian or Japanese vegetable seeds at Chinese seed stores or Asian grocery stores. Overall, most of the participants mentioned that they have recently seen a greater variety of Japanese vegetable seeds sold in local seed stores and grocery stores than before.

Some of the participants also told me about Japanese community events. They said that vendors at Japanese community events also sold Japanese vegetable seedlings. On my visits to Japanese farmers’ market and spring festival in Burnaby, I found seedlings of Japanese vegetables, such as myouga and wasabi (see Appendix B).

It was common among farmers, home and community gardeners in particular, to exchange seeds or seedlings. Some of the community gardeners even had experiences of their friends giving them seeds as gifts. A few participants got seeds from their family or friends in the southern interior of BC.

The participants expressed a number of challenges and benefits related to seed storage. One participant talked about the short fall season in BC that made it difficult to store seeds. He said that seeds could not be dried sufficiently
because of the wet and short fall. On the other hand, another participant said that the cool and dry summer in BC was good for storing seeds. She compared her farming experiences in Japan and Canada saying: “the summer in Japan is hot and humid. So the germination rate of seed decreases dramatically within a year. However, if I store seeds here, they last longer than in Japan.”

Some participants said that there was no need to store seeds for some heritage varieties, because they had become wild plants in the Lower Mainland in BC. For example, fuki and yomogi (Japanese mugwort) (see Appendix B) have been growing wildly in the Lower Mainland in BC. There is a fuki bed in the in the Terra Nova region in Richmond where the early Japanese immigrant workers and their families lived. Yomogi can also be found growing wild in Terra Nova.

A few participants mentioned about itadori (Japanese knotweed) (see Appendix B). Itadori is one of the most “unwanted” invasive plants in BC (Invasive Species Council of British Columbia, 2013). However, Itadori is considered as an edible plant in Japan, and cooked in different ways.

5.2.4 Pest, Disease and Weed Management

Not many concerns regarding pests, diseases and weeds were expressed by the participants. Many participants who had farming or gardening experiences in Japan, said that compared to Japan, they had fewer pest and disease problems in Canada. However, slugs, aphids and wireworms were major pests that the participants identified as their concerns. They said that slugs and aphids bit sprouts or leaves of vegetables, and wireworms bit roots of vegetables. There
was also a concern from community gardeners regarding animals, such as rabbits, mice and birds that ate plants or compost at their plots.

No or minimal use of commercial pesticides and herbicides was common among the participants. Two commercial farmers run organic farms. The rest of the participants did not describe themselves as organic gardeners or farmers, however all of them were found to use little or very little amount of pesticides and herbicides.

Since the participants did not rely on chemical substances, physical control or use of natural and homemade products were the most common management techniques for pests and diseases. There were a variety of natural and physical control methods for pests and weeds. Some of the examples are;

- Put containers full of beer in the field to lure slugs.
- Spray milk diluted with water to kill aphids. The milk: water ratio is 1:10
- Dissolve a small amount of dry yeast and sugar in water in a container. Put the container in a garden to lure slugs.
- Spray vinegar diluted with water to kill aphids and mites. The vinegar: water ratio is 1:50.
- Apply fabric cover cloth to protect plants from pests.
- Apply straw mulching to prevent rain from rebounding from soil and transmitting mildew.
- Crop rotation to lower density of certain pests.
- Kill insects and remove diseased plant parts by hand.
• Use companion planting, such as tomato and basil, or garlic and rose.
• Put a sheet of aluminum foil at the base of a plant stalk to avoid aphids.
• Put copper wires to avoid slugs. The copper wires are placed directly on the soil around a garden or along the low of plants to deter slugs.
• Hang a yellow sticky tape as a trap for bugs.
• Boil Japanese andromeda (asebi in Japanese) with a small amount of garlic and hot red pepper. The amount of garlic and red pepper is one-tenth of Japanese andromeda. Cool down the andromeda/pepper extract and dilute it with water. The ration of the andromeda/pepper extract: water ratio is 1: 1000. Apply the liquid to daikon to prevent aphids and green caterpillars.
• Apply the liquid from compost that is made from EM bokashi (see page 42) and vegetable scraps to plants. The liquid prevents maggot infestation.
• Apply lavender oil to plants to prevent slugs.

Among commercial farmers and gardeners, weeding was mostly done by hand or with tools such as a hoe, sickle or weeding fork (see Figure 1). Even the three commercial farmers, who worked a larger area than home and community gardeners, were found to weed mostly by hands or with handy non-mechanized tools. The farmers said that one of the benefits of hand weeding was the flexibility. One farmer was weeding by hand, saying: “weeding is not all the same; it is different depending of the root structures. It is important to know the characteristics of weed, and weed accordingly. For example, Canadian Thistle
has a deep root system. I have to deeply dig in the ground around the Canadian Thistle and remove the root completely” Another farmer said; “I always remove weeds by hand when they are very small because I do not want to let them grow tall.” Some participants used straw mulching. Winter pea, wheat and vetch are some examples of straw that they used for mulching. One participant taught me how straws worked as mulch. The mechanism is that straws mulching materials cover the soil and block the sunlight so that weeds cannot grow.

Figure 1. Weeding tools (from left): knife, weeding fork, kusakezuri (traditional Japanese weeder) and kama (sickle).

5.2.5 Soil Management

I did not hear any serious concerns about the quality of soil. However, a few participants said that soil in their garden tended to be strongly acidic and not good for vegetable production. They used lime to adjust soil pH when they prepared soil for planting. One participant explained from her experiences; “due
to long rainy season, soil becomes acidic easily.”

Although the participants identified no serious soil problems, all of them mentioned the importance of using soil amendment. All of the participants inputted organic matter to keep nutrients in the soil. A wide variety of organic matter was applied as soil amendments. The following are examples of organic matter used by the participants.

**Compost**

All the participants made compost. It was found to be the most important soil amendment for gardeners as they used compost as the major source of organic matter. Even though the commercial farmers made compost at their farms, it was not their main source of organic matter. They used other materials such as tofu residue or fish fertilizer as soil amendment.

Vegetable scraps and fallen leaves were commonly used as ingredients for making compost. Most of the participants did not have preferences for ingredients for compost; however, one participant was careful about the ingredients saying: “tomato and cucumber stalks cannot be used because they might have fungi or bacteria.”

For making compost, some participants used wood frame compost bins while others used plastic compost bins. Some participants did not use compost bins, and made a pile of compost on their property. It was difficult to generalize how long the participants waited until the ingredients were broken down and turned to compost. However, one participant said from her experiences: “after
one year, the ingredients are broken down. However, I only use the compost that
has been decomposed for three years because the texture is fine and mixed well
with soil.”

**Bokashi**

Some participants used bokashi, which is partially fermented organic
material.

Bokashi is made from organic matter, such as rice bran or chicken manure. The
organic matter is fermented by mixing with soil or other materials. The
fermentation process is important to make bokashi. If raw organic matter is
applied and decomposed in soil without being fermented, the decomposition
process sometime damages vegetable roots. The fermentation process softens
the damage from raw organic matter. In Japanese, bokashi can also be
translated into “ambiguous” or “obscure”. Since the effect of raw organic matter
becomes mild through fermentation, partially fermented organic matter is called

Bokashi is different from compost in that bokashi needs only 20 -30 days
for the fermentation. On the other hand, compost requires at least four months
for the fermentation because the ingredients need to be broken down and
fermented completely. The heat of fermentation is also different between bokashi
and compost; bokashi needs lower temperature than compost. For bokashi, the
heat of fermentation is kept at less than 50ºC. On the other hand, compost is
fermented at around 70ºC. One of the benefits of using bokashi is that bokashi is
rich in microbial diversity. As mentioned before, since bokashi is fermented at less than 50°C, the low temperature does not kill beneficial microorganisms. In fact, the fermentation process increases microbial diversity. Another benefit of using bokashi is that bokashi is high in nutrients. Although it depends upon ingredients, the nutrients in bokashi are ten times higher than in compost. Since bokashi has a high density of soil nutrients, there is no need to make large quantity of bokashi. In other words, bokashi does not require much space, labor and time to prepare and use. Also, bokashi is a slow releasing fertilizer. Bokashi works for a long time although it takes more time to become effective in soil than chemical fertilizers (Miyoshi, 2012, p.66-67).

There were two kinds of bokashi used by the participants; EM bokashi and natto and rice bran bokashi. The following recipes are some examples that I heard from the participants.

- **EM bokashi**

  EM bokashi is organic matter fermented by effective microorganism. Effective microorganisms are a combination of microorganisms that have the positive effects of fermenting organic matter or promoting photosynthetic (Effective Microorganisms Laboratory Co., Ltd., n.d.).

  **Ingredients**: wheat bran, EM culture mix, and molasses.

  1. Add EM culture mix and molasses to wheat bran and mix them in a plastic container, such as a bucket or plastic bag.
2. Seal the container as tightly as possible because effective microorganism is anaerobic. Air is not supposed to be in the container so that effective microorganisms will ferment wheat bran.

3. After the fermentation process is completed (for about two weeks), the wheat bran becomes EM bokashi. EM bokashi can be stored from two to ten years.

4. Mix the EM bokashi with vegetable scraps and compost them together for two to three months. Or pile EM bokashi and vegetable scraps in a bucket. When the bucket is full, EM bokashi and vegetable scraps are composted together with fallen leaves outside. Within two years they will be soil.

EM culture was available in the Lower Mainland and on the Vancouver Island. For example, one participant bought EM culture from her friend who owned a mushroom farm. Another participant bought EM culture from the United States. However, it was common among the participants to share EM culture with gardener friends.

Wheat bran can be substituted for rice bran. The participants stated that rice bran was commonly used for EM bokashi in Japan. However, since it is difficult to get rice bran in Canada, the participants used wheat bran instead of rice bran.

EM bokashi can be applied to soil directly; however, it was common among the participants to mix it with vegetable scraps and make compost. Most of the
participants who used EM bokashi were satisfied with the fact that it did not have any odor.

There is liquid when EM bokashi and vegetable scraps are composted. A participant said that the liquid could be applied to root vegetables. According to his experience, the liquid prevented maggots from eating root vegetables.

- **Natto and rice bran bokashi**

  Natto and rice bran bokashi is organic matter fermented by natto bacteria. Natto is fermented soybeans and one of the famous foods in Japan.

  **Ingredients:** rice bran, natto, and water

  1. Mix rice bran and water in a plastic container till the rice bran becomes crumbly.
  2. Dilute natto with cold water or tepid water, and mix with the rice bran.
  3. Spread newspaper (or any kind of paper) on top of the rice bran. This paper prevents the rice bran from getting dry.
  4. Seal the container. Do not seal the container tightly because natto bacteria need air to be active.
  5. Mix the rice bran every day until heat develops in the container (about 2-3 days).

    The rice bran becomes fine and the heat disappears after 2-3 weeks. The fermented organic matter is rice bran and natto bokashi.
Natto can be purchased at local Asian grocery stores in the Lower Mainland or on Vancouver Island. However, a few participants made natto at their homes. They steamed soybeans, and mixed them with natto bacteria that they extracted from purchased natto.

**Other organic matter**

A couple of the participants used “dotyuu taihi”. Dotyuu taihi means organic matter that is composted in soil. One participant ground vegetable scraps with a kitchen grinder and added them in soil directly. Another participant used rice bran and tofu residue. The participants said that the raw organic matter gets decomposed insitu and enriches the soil. However, one of the participants said that dotyu taihi did not work well in cold weather. She explained: “the cool temperature slows down the composting process. It takes a long time for tofu residue (that she used for dotyuu taihi) to be decomposed in soil in spring and fall.”

As mentioned above, compost was the major input for soil amendment among the home gardeners and community gardeners. Most of the home gardeners and community gardeners did not use commercial supplements. However, all of the farmers used commercial supplements, such as fish fertilizer or SEA SOIL™ to promote good soil condition (Foenix Forest Technology Inc., 2013).

It was also popular among the participants to use manure, such as cattle manure, mushroom manure, chicken manure and sheep manure.
5.2.6 Off Season

Although most of the participants did not grow vegetables and herbs in winter, the winter season is also important season for preparing soil for the next year. Winter soil care is common among the farmers and gardeners. Examples of soil management in winter are:

- Adding leaf mold on soil and covering the soil with a black plastic sheet.
- Covering soil with compost to protect soil from cold and frost.
- Adding tofu residue to soil and mixing them well.
- Turning soil on frost days to kill eggs and pupae of insect pests.
- Sheet mulching with horse manure, cardboard, EM fungi, straw and leaves (for no-till farming for next growing season).
- Growing cover crops, such as wheat, vetch and phacelia (scorpionweed).

5.3 USE OF PRODUCE

In this section, I focus on how the participants use their produce. There is a substantial difference in the ways that gardeners and farmers use produce.

5.3.1 Gardeners

The gardeners grew vegetables, herbs and fruits for their home use. However, it was common that the gardeners have left over produce. Most of the gardeners said that they could not consume all of the produce by themselves. One participant even said that only one tenth of the produce could be consumed at home. This is because most of the gardeners did not live with a big family; most of the families consisted of two persons. If their daughters’ or sons’ families
lived nearby, the gardeners gave their produce to them. They also gave their produce to friends, churches, or job clients. Some participants even sold their produce at the Japanese community events and donated the earnings to the organizers of the events.

It was also common for some gardeners to exchange their produce with friends in a hobby club or with neighbors. A benefit of exchanging produce is to get vegetables and herbs that they do not grow. One participant even got seafood, such as shrimp or salmon, from fisherman friends in exchange for produce from the garden.

It was also common among the gardeners to preserve left over produce. For example, some gardeners pickled daikon or turnip with salt, sugar and vinegar. One participant stored greens, such as kabu leaves, in a freezer. The greens were chopped, and quickly boiled, before storing in a freezer. The participant said that it is easy to use the frozen greens for miso soup or other boiled and seasoned dishes. Another participant made a paste from shiso or basil and stored them in a freezer.

5.3.2 Farmers

Although the farmers ate vegetables, herbs and fruits from their farms, most of the produce was for sale. The farmers used a variety of market channels. Two of the farmers mainly used direct markets: farmers markets or/and vegetable box program. The farmers markets that they participated in were open once a week in summer; the farmers packed their produce and brought the produce to the
market. The farmers were assigned a spot at the farmers market; they set up a tent with a booth and sold their produce.

The vegetable box program is also called “Community Supported Agriculture Program”. At a farm that had a vegetable box program, the farmer and workers packed seasonal and fresh produce in a box according to the price that the customers paid in advance. The customers came to the farm to pick up their vegetables.

One farmer mostly sold the produce through wholesale. The farmer packed the produce at the farm and brought them to wholesale three times a week. During the packing process, they graded their produce into three grades: first grade, second grade and third grade. First grade was for retail stores; second grade was for prepared or processed food, such as pastry, pickles or food served in restaurants or pastries. Third grade was for home use or donation for events. The wholesaler received first or second grade produce and distributed them to markets accordingly.

Direct sales to local retail stores and restaurants were also alternative market channels for the farmers. Two farmers sold their produce to local retail stores. One of them also sold their produce to a local Japanese fusion restaurant.

All of the farmers said that their customers were from a wide range of cultural backgrounds. Most of the farmers felt that there was an increasing demand for Japanese vegetables not only from people of Japanese descent but also from people of different ethnic backgrounds.
5.4 ATTITUDE AND PERSPECTIVES OF FOOD PRODUCTION

This section focuses on discovering the participants’ attitudes and reflections on their gardening and farming activities. This section also examines what the participants expect from growing food and their plans for the future.

5.4.1 Reasons for Gardening and Farming

The participants had varied reasons for starting gardening and farming. However, most of the participants expressed that their desire to eat what they wish to eat was one of the reasons for growing food. Freshness, safety and flavor were the most important indicators for their food choices. Some participants also said that they started growing Japanese vegetables because they missed Japanese food.

Gardening and farming experiences in their childhood or younger age encouraged the interview participants to become engaged in gardening or farming. Some participants grew up on a farm; others had gardening experiences in their childhood. Some participants went to agricultural university or had a garden in Japan. The experiences of growing food at an earlier age encouraged them to start gardening or farming in Canada.

Some participants mentioned that they gained physical and mental satisfaction through gardening or farming. One farmer said: “I found it not good to be away from physical exercise. Farming gets me to do physical activities.” One gardener said that he attained peace of mind through gardening. He said: “I got stress from my job. So gardening worked well as a means to make me relax in
weekend.” A few gardeners also said that they enjoy connecting to people through gardening. Gardening provided them with an opportunity to talk about food with other gardeners, and to share their produce with family or friends.

Furthermore, one participant who has a child said that gardening is educational. She said: “My son loves to help me in garden. He did not like tomato. However, he came to like tomato after growing his own tomato.”

Another reason, expressed especially by commercial farmers, was attaining land for farming. Most of the farmers in this study mentioned that it was possible to start a farm because they had land suitable for farming. Although there were also other reasons for the farmers to start a farm, one of important motives for them to be farmers in BC was getting land that was suitable for commercially growing vegetables.

5.4.2 Where to Learn

When responding to the question regarding the sites of learning, the major answer from the participants was learning from family members. Eight out of 12 participants said that they learned about food production from their families. Some participants grew up on a farm and said that their childhood at a farm taught them about food production. For example, one participant felt that she learned about farming from her parents, stating: “my parents have had a farm since I was small. I did not help them out at all. But now, I know that seeing or observing what my parents were doing was important. Even seeing their works makes a quite difference.”
Other participants said that their grandparents or parents had a backyard garden, and they learned about how to grow and preserve food at the backyard garden. One participant learned how to grow vegetables when she married her husband who owned a farm.

Another major answer was learning from each year’s experiences. Most of the participants said that each year’s experiences, even mistakes, trained them to do better for the following season. One participant explained: “we have to think about how to work efficiently. Thus, working experiences teaches us and generates new ideas…..We also read book, and learn from friends. But growing food cannot be understood by just being told by someone. We need experiences…..It took us for four years to be familiar with the business. For four years, we tried, tried and tried.” Another participant made a gardening plan based on his experiences, saying: “I remember how much yields I got from each plants in past, and decide what and how much to plant for this year.”

Books and the Internet were also common sources of information on gardening and farming. Some participants also said that they learned about gardening and farming through networking with other famers and gardeners. For example, one farmer said that she visited her friend’s farm and learned about farming techniques through working with them. Community gardeners exchanged knowledge about gardening with each other. I had lunch with two community gardeners, their friends and family; most of the topics that they talked about were gardening, such as seed and soil management. They seemed to enjoy updating each other about their gardens and talking about vegetables and herbs.
5.4.3 Future Plans

Only one home gardener and one commercial farmer expressed interest in expanding the garden and farm. Other interview participants wanted to produce less or keep the same scale of production.

**More production**

The reasons for expanding a garden or farm were varied. One home gardener wanted to expand his garden because he was close to retirement, and expected more time for gardening. He wanted to grow more kinds of vegetables and share his produce with many people. He also knew that there is an increasing interest in growing vegetables in Japanese communities; it was his hope that more people would know about gardening. He wanted to share his gardening experiences with his friends or people who want to start a garden.

One commercial farmer also wanted to gradually increase the production because there was more demand for the vegetables than available supply. The farmer's customers wanted vegetables from the farm, but the farmer did not supply enough to meet the demand. The farmer wanted to increase production so that more customers could enjoy vegetables from the farm.

**Less or the same production**

On the other hand, physical concerns and lack of labor were the major reasons that discouraged some of the participants from more gardening or farming. Some participants had physical concerns because gardening and farming requires a large amount of labor. Gardening and farming practices of the
participants were labor intensive. For example, soil and weed management were done by hand or with hand powered tools. Considering their age, some gardeners were not sure if they could continue doing the same practices. For farmers, lack of labor was identified as the reason for farming less or at the same scale. A few farmers said that more production would be possible if they could have more labor force and time.

Another reason expressed by some gardeners was that they were already satisfied with the current size of gardening and farming. They produced enough vegetables and herbs for themselves and friends; they wanted to continue producing vegetables and herbs at the same scale.

5.5 PARTICIPANT PROFILES

I profile three participants in this study. The aim of these profiles is to illustrate some examples of gardening and farming activities from the interviews. The profiles also provide a representative view of food production within the Japanese communities.

There are three categories of interview participants: commercial farmers, home gardeners and community gardeners. There was no bias for selecting these three participants I randomly chose one participant from each category by lottery, and then asked each selected participant if I could write about her or his profile for inclusion in this thesis. Each selected participant reviewed what I had written as a profile.
5.5.1 A ‘Home Gardener’

The participant immigrated to Canada in the 1950s when she married her husband who immigrated to Canada before her. She and her husband owned a cucumber farm for 25 years. Their farm was a pioneer farm for industrially producing long English cucumbers in the area. She did not have a home garden when she worked on the cucumber farm. When she retired from the cucumber business, she changed her farm to a home garden.

Her garden is about 0.4 hectare (one acre). Although she mostly takes care of her garden by herself, her son sometime helps her with difficult work. She grows various vegetables, herbs and fruits. Some examples are fuki, cucumber, tomato, shiso, daikon, runner beans, and pears. The gardening season is from late spring to late fall. In the winter, she lets the soil rest. She also takes care of compost over the winter. She collects fallen leaves, and makes piles of them for compost. The seeds she used to plant her garden are mostly from her friends. She asked her friends to buy seeds when they visited Japan. She also stores seeds for some vegetables, and uses them in the next growing season.

Her garden is organic; she does not use commercial synthetic fertilizer, commercial pesticide or herbicide. To maintain soil fertility, she uses compost made from fallen leaves and vegetables scraps. There is a pile of fallen leaves and food scraps in her garden. She composts them for about two years because all of the ingredients are broken down well by then, and there are many earthworms in the piles after two years. She does not have serious problems with weeds and pests. Weeding is done mostly by hand. She does not eliminate pests
as long as they do not damage her vegetables. However, she sometime uses natural and home-made products for pest management. For example, she dilutes milk with water to spray on aphids or green caterpillars.

She likes to share her vegetables with friends. Her vegetables are famous among her friends. She is often asked to sell her vegetables to friends or owners of small lodgings. She sometime sells her vegetables and food, such as pickles or cooked beans, at community events.

She learned about gardening when she operated the cucumber farm with her husband. Her husband was knowledgeable about farming, and good at growing vegetables. In addition, she grew up in a big family of nine people, including grandparents. It was common for her family to harvest vegetables from the home garden, and cook them for meals or use them for preserved food. She learnt about gardening and cooking from observing and helping her family.

She describes gardening as a hobby for making everyone happy. She gets physical and mental satisfaction from gardening, as well as cooking and sharing her produce with her friends. On the other hand, her friends are also happy to taste the fresh, organic and seasonal vegetables from her garden.

5.5.2 A ‘Commercial Farmer’

The participant immigrated to Canada with her husband to start an organic farm in the 1990s. She and her husband owned an organic farm in Japan for 8 years before immigrating to Canada.
Her farm is about four hectares (ten acres) including more than 25 greenhouses. There are employees, an apprentice and volunteers at the farm. Her farm is a certified organic farm. She considers how to manage soil, weeds and pests. For soil management, she mainly uses tofu refuse from a local organic tofu company. She mixes tofu residue with soil before sowing. She also applies organic fish fertilizers as needed. She occasionally uses rice bran natto bokashi, which is made from rice bran and fermented soybeans (see page 44). She grows Japanese and western vegetables year round. At the farm, more than one hundred kinds of vegetables, such as daikon, kabu, beets, mizuna, komatusna, zucchini and strawberries are produced throughout a year.

She buys seeds from seed companies in Japan and Canada. Since the farm is organic, all seeds come with organic certification. She also saves seeds from some vegetables and uses them in the next growing season. Pest management is mostly done by combining different kinds of control methods, such as multiple cropping, crop rotations, using fabric row covers, or collecting pests by hand. Weeding is mostly done with hand-powered tools or by hand.

Harvesting, washing and packing vegetables are also done by hand. She sells her vegetables through direct sales, such as a farmers market or a vegetable box program. She prefers direct sales because she likes to meet and communicate with her customers. She also sells her vegetables to local Japanese restaurants and retail stores. Although she does not use any advertising for her produce, her vegetables are famous among local customers through word of mouth. The customers are not only Japanese who live in the
area, but also people from various cultural backgrounds.

She learned about growing food in her childhood. Her parents had a farm. She did not like helping her parents; however, she remembers many things about food from her childhood because she observed what her parents did at the farm. She also actively participated in workshops about organic farming when she and her husband owned a farm in Japan.

She wants to produce more vegetables because many customers want to buy her produce. In addition, she wants to support other local producers. She likes to buy bread from organic bakers, as well as fish and dairy products from local producers. She and workers at the farm like talking about local food or cooking. She also has a dream of training young farmers who can feed local communities.

5.5.3 A ‘Community Gardener’

The participant started backyard gardening six years ago when she lived in Eastern Canada. There were not many ingredients for cooking Japanese food in the neighborhood. However, when she hiked a trail, she found edible wild plants, such as fuki or horsetail that were commonly eaten in Japan. Through collecting the edible wild plants, she became interested in growing vegetables. When she moved to BC, she started gardening in a community garden.

Her garden is about 21 m². She produces Japanese and Western vegetables and herbs all year around. For example, in summer, she grows zucchini, potato, rakkyo or green pea. In winter, she grows kale, chard, broccoli
or onion. Seeds are from seed companies in Japan or Canada. She does not store seeds because the garden is not large enough to grow vegetables only for gathering the seeds.

Her garden is organic. She uses chicken manure for soil amendment. She also adds lime or compost from food scraps as needed. She uses a clay pot as a compost bin because she finds that the food scraps in a clay pot are broken down faster than in a plastic compost bin. She also finds there are more earthworms in a clay pot than in a plastic compost bin.

There are not many serious problems of weeds or pests in her garden. Weeding is mostly done by hand. Pest management is done by using natural and home-made products. For example, there are many slugs in her garden because there is a lot of rain in spring. She added used ground coffee beans into soil. She also put copper wires around her garden. The copper wires are taken from a scrubbing brush made from copper because copper wire is expensive in general. She is also interested in using lavender oil to remove slugs.

She learned about gardening from her father who used to be a teacher at an agriculture school. She also likes to watch Japanese TV programs about gardening. She grows various vegetables and herbs, and uses various materials for pest management or frost protection. Other gardeners often ask her about her vegetable or pest management.

She likes to share her produce with friends. She preserves produce in a freezer. For example, she freezes boiled beans or ground zucchini, and uses
them for cooking or baking.

She wants to expand her garden if land is available. She wants to produce more vegetables so that she can get all vegetables for home cooking from her garden all year around. In addition, her son and his friends like to come to her garden. They enjoy harvesting vegetables, playing with insects and even cooking vegetables. It is a good surprise for her that her son and his friends began to like vegetables more after gardening experiences. She wants a bigger garden so that her son and his friends can have more gardening experiences.
6 DISCUSSION

In the previous chapter, I described farming and gardening activities within the Japanese communities. In this chapter, I examine opportunities and difficulties pertaining to growing Japanese vegetables in the Lower Mainland and on Vancouver Island based on the findings from the semi-structured interviews. This chapter also discusses how the food knowledge within the Japanese communities could be integrated with the current local food movements. Further explanation of Japanese vegetables and herbs is available in Appendix B.

6.1 OPPORTUNITIES

In this section, I discuss what has been successful in terms of growing Japanese vegetables and herbs in the Lower Mainland and on Vancouver Island. There are four categories: production, access to seeds and seedlings, marketing, and community involvement.

6.1.1 Recommended Vegetables

Through the interviews, it became apparent that there were more than 80 kinds of vegetables, herbs and fruits grown by the participants. This study does not refer to species or varieties because the participants did not always know the genus and species names or varieties of vegetables or herbs. Even though most of the crops cultivated by the participants were Japanese vegetables and herbs, they also grew Western vegetables, other Asian vegetables and even flowers.

This study revealed that growing Japanese vegetables and herbs was not difficult in the Lower Mainland and on Vancouver Island. As mentioned in Chapter
5, the participants successfully cultivated Japanese vegetables and herbs such as daikon and kabu (see Appendix B), during the growing season.

These vegetables and herbs were widely grown because they fit to the summer weather in the Lower Mainland and on Vancouver Island. Daikon grows well at temperatures between 17°C and 20°C (JA-TSUYAMA, 2012a); kabu grows well between 15°C and 20°C (JA-TSUYAMA, 2012b). The Lower Mainland and Vancouver Island have cool summers. According to Environment Canada (2012b), the daily average temperature from May to August in Vancouver (in University of British Columbia: UBC) ranges from 12.3°C to 17.1°C.

Daikon and kabu need relatively strong sunshine to grow (Kumamoto Prefecture, 2011). The average total hours of bright sunshine in Vancouver (UBC) from May to August are about 244.3 hours (Environment Canada, 2012b). Although lack of precipitation in summer is a concern, the cool temperatures and plenty of sunshine are beneficial for growing daikon and kabu in the Lower Mainland and on Vancouver Island.

Furthermore, there was another reason for the popularity of growing daikon among the participants. Leaves of daikon are edible and nutritious. The leaves can be also cooked in a variety ways, such as stir-frying, miso soup or pickled. The participants enjoyed cooking not only the root but also the leaves. The participants explained; “in Japan, daikon was sold with the leaves. However, it is difficult to find daikon that comes with the leaves here. So it is good to grow daikon at my garden.”
It is even advantageous to grow some Japanese vegetables and herbs in summer in the Lower Mainland and on Vancouver Island. For example, many participants said that fuki could be grown better in the Lower Mainland and on Vancouver Island than in Japan. Fuki is in season from April to July in Japan because the stems become hard in texture and bitter in taste after July (Uyeda, 2002). However, some participants found that fuki could be grown year round in the Lower Mainland and on Vancouver Island, and the stems were also soft and edible regardless of the season. The factors that contributed to the ease of growing fuki were not identified. However, it is apparent that fuki is well adapted to ecological features in the Lower Mainland and Vancouver Island.

Some participants were also of the opinion that runner beans grew better in the Lower Mainland than in Japan. Runner beans are an important part of Japanese cuisine. Runner beans are grown in only certain regions in Japan and are considered as an expensive crop because runner beans require low temperatures for healthy growing. Runner beans grow well in cold and highland areas of more than 700m above sea level. In temperate regions, runner bean does not produce many beans even though it produces many flowers (Japan Bean Funding Association, 2005.; JA Rihoku, 2001.; Tsumagoi Village Office, n.d.). However, some participants found it is easy to grow runner beans in BC.

As mentioned, runner beans are grown in cool and highland regions of Japan (Tsumagoi Village Office, n.d.), where the daily temperature and humidity is low in summer. The lower Mainland and Vancouver Island have cool and dry summers. According to Environment Canada (2012b), the daily average
temperature from May to August in Vancouver (UBC) ranges from 12.3°C to 17.1°C. In addition, the average rainfall from May to August in Vancouver (UBC) is 52.8 mm. The relatively cool and dry weather in summer in the Lower Mainland and on Vancouver Island are important factors for successfully growing runner beans.

Komatsuna, mizuna and syungiku (see Appendix B) are examples of some vegetables that are successfully cultivated in summer as well as in cold season. Many participants said that komatsuna, mizuna and syungiku had a long growing season. The reason is that these leafy vegetables are adapted to a wide range of temperatures. Although the ideal temperature to grow these leafy vegetables is from 15°C to 25°C, these leafy vegetables are cold resistant and are not harmed by temperatures below 0°C (JA-TSUYAMA, 2012c.; JA-TSUYAMA, 2012d.; JA-TSUYAMA, 2012e). The Lower Mainland and Vancouver Island have mild winters. There are only a few days when the temperature drops below 0°C. The average daily temperature in December and January in Vancouver (UBC) is 3.7°C (Environment Canada, 2012b). Because of their adaptability to a wide range of temperatures, komatsuna, mizuna and syungiku have a long growing season in the Lower Mainland and on Vancouver Island.

Overall, some of Japanese vegetables and herbs are well adapted to the cool temperatures in summer and mild temperatures in winter. It is also easy to take care of these vegetables and herbs. No serious problems relating to pests, weeds and diseases were identified by the interview participants while cultivating these vegetables and herbs. Some participants who had gardening or farming
experiences in Japan said that they had spent more time and labor for weeding in Japan compared to their experiences in BC. The participants also remembered that they saw more pests, such as aphids or green caterpillars in Japan than in BC.

Considering the adaptability to the weather conditions, and the minimal problems regarding pests, weeds and diseases, Japanese vegetables and herbs could be a good option for farmers and gardeners in the Lower Mainland and on Vancouver Island for commercial farms or gardens.

6.1.2 Access to Seeds and Seedlings

The participants revealed that seeds of Japanese vegetables and herbs have become more accessible than before. As mentioned in Chapter 3, seeds of Japanese vegetables and herbs have recently been sold in local seed stores, gardening shops and grocery stores in the Lower Mainland and Vancouver Island. The participants said that previously it was difficult to buy seeds of Japanese vegetables and herbs from local seed stores. However, some vegetables, such as mizuna, komatsuna and karashina (mustard green) have recently been available at the local seed stores and Asian grocery stores.

Some farmers were interested in selling seedlings of Japanese vegetables. One of the workers at a farm that I visited for interviews told me that the customers became interested in growing Japanese vegetables and herbs when they came to know more about Japanese vegetables and herbs. The worker was often asked where to find Japanese vegetable seedlings, and how to grow
Japanese vegetables. The requests for seedlings of Japanese plants were mostly from young families who lived in suburbs.

Although there are farmers who cultivate Japanese vegetables, there are not many farmers who sell seedlings of Japanese vegetables. One of the farmers shared her dream with me, saying; “I want to grow seedlings of Japanese vegetables for my customers so that they can grow Japanese vegetables in their gardens.” In fact, the worker already has started a small pilot business to grow seedlings of shiso or Japanese chive, and sell them to her customers. There is potential market for seeds or seedlings of Japanese vegetables and herbs in the Lower Mainland and on Vancouver Island.

6.1.3 Marketing

It was revealed through the interviews that Japanese vegetables have been recognized by Canadians and other ethnic communities in the Lower Mainland and on Vancouver Island. The farmers in this study felt that the demand for their produce has been increasing. The customers were not only Japanese but also people of various cultural backgrounds. According to the farmers, demand for their produce exceeded the supply that they were able to provide the customers.

Home gardeners and community gardeners were found to share their produce with their families or friends among whom their produce have a good reputation. Some of the gardeners even received seeds from their friends as gifts, and were asked to grow more vegetables.
In addition, the community events were a good place to buy Japanese vegetables and herbs. For example, many customers came to buy locally grown Japanese vegetables, seedlings, and food at a farmer’s markets or plant sales. The customers were not only Japanese but also people from various cultural backgrounds.

Through the interviews and my observations, it is apparent that there is an increasing opportunity for marketing Japanese vegetables and herbs. The market could be expanded not only within the Japanese communities but also within other ethnic communities. This is a big change compared with the era of pre and post WW2. One participant recalled her experience of growing Japanese cucumbers when she immigrated to Canada after WW2. At the time, Japanese cucumbers were not welcomed by non-Japanese customers because of the shape. She had to dump most of the Japanese cucumbers; however, she has recently seen Japanese cucumbers sold at local markets. I assume that customers’ attitudes regarding the Japanese cucumbers have changed.

In addition, as noted in the literature review, before WW2, Japanese vegetables and herbs were mostly grown for home use or Japanese communities. There were earlier Japanese immigrants who worked for industrial farms, such as berry farms (Yesaki, 2003). However, there is no literature about commercial production of Japanese vegetables in that era of Canadian history.

In contrast, these days, Japanese vegetables and herbs are being sold in local grocery stores or farmers markets. As mentioned, the farmers in this study
were successful in selling their produce. Their vegetables were popular among the local customers. All farmers studied had a lot of demand for their produce from the customers. The farmers felt that there were more potential markets in the Lower Mainland and on Vancouver Island.

The strength of the farmers’ marketing strategies was building a good relationship with their customers or buyers. The farmers liked to communicate with the customers and buyers, and wanted to know about their needs from the customers and buyers. On the other hand, the customers and buyers trusted the farmers because their produce was of high quality, and fit their needs. Another strong point of the farmers’ marketing strategies was using different kinds of market channels. The farmers in this study used both direct and indirect sales and secured their markets using a wide range of marketing channels. They were flexible toward changing marketing strategies. If one market channel does not work well, they can shift their produce to other market channels. There are opportunities to expand the market for Japanese vegetables and herbs through utilizing different market channels: farmers market, box programs, retail stores, restaurants, and wholesale.

There is also an opportunity for home and community gardeners to sell vegetables and herbs. According to Guidelines for the Sale of Foods at Temporary Food Markets, sales of fresh whole fruits and vegetables are permitted without a food premise application (Food Protection Services. BC Centre for Disease Control, 2012). This regulation indicates that public events and farmers markets would be a potential market for home gardeners and
community gardeners.

This study revealed that most of the home gardeners and community gardeners had excess produce, and could not consume all of the produce by themselves. There would be marketing opportunities for home gardeners and community gardeners to participate in public events and farmers markets as vendors. In fact, there was a successful example where a home gardener sold vegetables, herbs and fruit at community events. Her produce was very popular, and the participants looked forward to buying her produce. She said that it was good to have rewards for her gardening work, and invested the income for improving her garden. Participation in markets is a good outlet for gardeners for generating extra income from excess produce from their gardens. In addition, the opportunity for participating in markets was seemed to encourage gardeners to produce more vegetables or herbs in their gardens.

6.1.4 Community Involvement

In this section, I will discuss the value of community involvement in farming and gardening activities. All of the participants in this study were sociable and friendly. They enjoyed connecting with others through gardening and farming activities. As mentioned in Chapter 5, they had a strong network with other gardeners and farmers, and it was common among them to exchange seeds, produce, and knowledge about growing vegetables. Most of the participants were also involved in social activities through hobby clubs or churches. They brought extra produce or seeds to hobby clubs or churches, and shared the produce or seeds with their friends. The participants found it joyful to share seeds and
produce, and talk about food with others.

Community events were also important for the participants. There were plant- or food-related community events within the Japanese communities. These events are good places where people get together and learn about gardening or cooking. For example, local and fresh Japanese vegetables and herbs, and cooked traditional Japanese food were available at a Japanese farmers market. Seedlings of Japanese vegetables or flowers were sold at the plant sale.

Some participants in this study attended the community events to buy local Japanese vegetables, seedlings, and traditional Japanese food, and to get resources for gardening. On the other hand, other participants attended the community events as volunteers or vendors. A participant helped to cook Japanese food for sale. Some participants attended the community events as vendors. The participants brought vegetables or herbs from their farms or gardens for sale. A few participants even sold preserved food, such as jam, pickles or cooked beans, at the community events.

These community events provided a good place where people could sell and buy Japanese vegetables, taste traditional Japanese food and get information about gardening and cooking from the vendors. Moreover, I noticed that these community events had been playing an important role to foster the passing of food knowledge among generations since the participants consisted of not only adults but also children, youth and elders.
Thus, social activities and community events are strongly associated with farming and gardening activities. The gardeners and farmers are connected to each other through social activities and community events, and create a strong network where they can share seeds, produce and even food knowledge.

The participants in this study found it advantageous to speak both Japanese and English. Most of the participants were bilingual, and used books and websites in Japanese and English to get information about gardening or farming. I assume that this is why the participants used a variety of pest and soil management techniques. The interview participants also enjoyed communicating with people from different cultural backgrounds about how to grow and cook vegetables. A community gardener in this study said; “I got to know many gardeners with different cultural backgrounds in this garden. We share our gardening experiences and learn from each other.” Thus, speaking both Japanese and English is beneficial for them to access a wide range of resources, and connect with farmers and gardeners with variety cultural backgrounds.

6.2 CHALLENGES

In this section, I analyze what is challenging in terms of growing Japanese vegetables and herbs in the Lower Mainland and on Vancouver Island. There are four categories in this section: short growing seasons; vegetables that are challenging to grow; labor intensiveness, and storage of knowledge. In each category, there are solutions or suggestions about how to address the challenges.
6.2.1 Short Growing Season

The major challenge of growing Japanese vegetables and herbs is the short growing season. According to the participants, the growing season is from spring (around April) to late fall (around late October). It is too cold to grow Japanese vegetables and Western vegetables in winter in the Lower Mainland and on Vancouver Island. For example, daikon, kabu, nappa cabbage, onion, cabbage, and broccoli are considered to be relatively cold resistant; however the participants found it difficult to grow these vegetables in winter. There are rainfall, frost and low temperatures in winter. The growing season was limited due to the cold and wet winter. The participants found the short growing season very challenging especially because most of them had gardening or farming experiences in Japan where they used to grow vegetables and herbs all year round.

Participants also said that the cold spring delayed the growing season in the Lower Mainland and on Vancouver Island. Spring is time for sowing or transplanting seedlings. However, rainfall, frost and low temperatures could occur in spring and damage seeds and seedlings because they are vulnerable to frost and low temperatures. Many participants had bad experiences when their seedlings died because of rainfall and frost in early spring. Others said that cold spring also caused early flowering for some plants, such as daikon and kabu. These plants start to bloom if they are exposed to low temperatures. The plants do not produce good roots if early flowering occurs. The inside of the roots have cracks, and the texture is bad.
The solution to extend growing season would be using a greenhouse. A farmer who participated in this study successfully grows vegetables year round in greenhouses even without heaters. However, a greenhouse could be costly for gardeners that grow vegetables and herbs on a small scale.

Thus, fabric row covers would be an alternative. The fabric row covers would be applied over plants to protect them from frost and low temperatures. Some participants use fabric row covers when it is cold and frost might occur. The thickness of the fabric row covers differed among the participants. The participants used different kinds of fabric row covers depending on the temperature and frost condition. For example, the participants used thin fabric row covers in summer because the temperature was high. On the other hand, the participants used thick fabric row covers in spring or early and late summer because the temperature was low. The participants also said that thick fabric row covers worked better for frost protection than thin ones.

Moreover, the choice of which vegetables and herbs to grow is important. Some Japanese vegetables and herbs are cold resistant, and have a long growing season in the Lower Mainland and on Vancouver Island. Some examples are komatsuna, mizna, and syungiku. These leafy vegetables are adapted to a wide temperature range and are good options for those who are interested in extending the growing season.

The solution for the cold spring is to be careful about rainfall and low temperatures, and to not be in a rush to sow seeds or transplant young plants. It
is recommended to check the long-term weather forecast and make a plan for sowing and transplanting. If it is cold in March and April, it is safe to delay sowing and transplanting until late spring around May when temperatures become relatively stable. Making use of fabric covers also would protect seedlings from low temperatures and frost during the cold spring.

Cold frames could be an alternative. None of the participants in this study used cold frames. However, I saw that some local community gardeners used cold frames in their plots when I visited a community garden in the Lower Mainland. Cold frames are wood frames with a window on top. When using cold frames, it is possible to start sowing early to grow seedlings (Barley, n.d.). Cold frames also extend the growing season to fall because the cold frame protects plants from low temperatures and frost. Flower bulbs even can be grown in cold frames during winter (Barley, n.d.). Cold frames do not require a large space, cost, and labor to maintain.

6.2.2 Vegetables that are Challenging to Grow

Although summer is a good time for gardening and farming in the Lower Mainland and on Vancouver Island, some vegetables and herbs do not grow well even in summer. For example, through the interviews, goya (bitter melon), edamame (immature soybeans) (see Appendix B), okra, eggplant, tomato and cucumber were identified as the vegetables that were difficult to grow.

Many participants were interested in growing these vegetables because these vegetables were important for seasonal Japanese dishes in summer.
However, from their experiences, most of the participants knew that these vegetables produced only small vegetables or did not produce vegetables at all.

A likely reason for difficulty of growing these vegetables is that they require high temperatures to promote good growth. For example, goya, okra, green, eggplant and edamame need 23-27ºC for germination and 22-30ºC for healthy growing. These vegetables are susceptible to cold weather. Cucumber and tomato are more resistant to cold weather than the vegetables mentioned above. However, cucumber and tomato still require relatively warm temperature, such as 21-25ºC for germination and 17-27ºC for healthy growth (JA Aichichuo, n.d.).

In the Lower Mainland and on Vancouver Island, the temperature in summer is not high enough for goya, edamamae or other vegetables. According to Environment Canada (2012), the daily average temperature in Vancouver (UBC) is 16.9ºC in July, and 17.1ºC in August. The average of daily maximum temperatures in Vancouver (UBC) is 20.4ºC in July and 20.5ºC in August. Considering the temperatures in summer in the Lower Mainland and on Vancouver Island, it is difficult to grow goya, edamame and other vegetables that require high temperatures to promote good growth.

One of the solutions for growing these vegetables is the use of a greenhouse. A farmer who participated in this study successfully produced eggplant or tomato in greenhouse in summer. However, as mentioned before, a greenhouse is costly for gardeners who do not do commercial production. In addition, a greenhouse requires a lot of space. It is difficult for backyard
gardeners and community farmers to make a space for a greenhouse.

Fabric row covers and mulch could be alternatives. In fact, some participants covered plants with fabric row covers in summer, and found that the fabric covers worked well. The fabric row covers kept the field warm and helped to retain soil moisture. There is also another benefit of using fabric row covers. The fabric row covers protect plants from sunburn and insect pests in summer. Other participants also used mulch. They covered soil with mulch made from plastic sheet or straw. These mulches absorb sunlight and keep soil warm.

Using a pot is another solution to grow vegetables that require high temperatures for growth. Some participants successfully grew Japanese eggplant, tomato and cucumber in pots during summer. A participant explained the reason from his experience saying; “these vegetables need high soil temperature because they are originally from warm or hot regions. However, soil temperature is not high here (in the Lower Mainland) even in summer, and I failed to grow these vegetables in my field. However, from my experience, I found that these vegetables grow well in pots because pots keep soil temperature higher than field.”

6.2.3 Labor Intensiveness

Japanese vegetable production is labor intensive. At all of the farms I visited for this study, the farmers sowed, weeded, harvested, washed and packed vegetables mostly by hand or with hand-powered tools. All of the farmers expressed the importance of having enough labor to work at the farms. Most of
them also said that they would produce more if they had more labor support.

From my hands-on experiences at two of the farms, I found that mechanical tools were not a good fit to Japanese vegetable production because most of the Japanese vegetables were vulnerable to damage. Japanese vegetables easily developed a flaw even by handwork and needed to be handled with care.

The farmers preferred to take care of vegetables by hand or with hand-powered tools because the customers care about the appearance, such as the shape and color of vegetables. Most of the farmers in this study sorted their produce according to the shape and color followed by labeling with grades. A farmer explained; “we need to be careful of how our vegetables look. It is a wrong idea that customers do not care about the outlook of vegetables as long as they are organic and local. Bad looking vegetables are not accepted by customers even they are organic and local.” It is important for farmers to ensure their vegetable appear appealing to the customers.

Home gardeners also expressed their concerns regarding labor intensiveness of growing Japanese vegetables and herbs. As mentioned in Chapter 5, physical concerns were one of the major reasons that discouraged the home gardeners from expanding their gardens. Gardening requires a large amount of labor, such as making piles of fallen leaves, turning soil over, bringing manure, or bending knees for sowing and weeding. From my observation, while many elders enjoyed gardening within the Japanese communities, the gardening work could be a physical burden for many elders.
A suggestion for commercial farmers to mitigate the labor-intensive work is to accept apprentices or long-term volunteers. One of the farmers in this study accepted an apprentice and short-term volunteer. The apprentice and volunteer lived at the farm and were trained about farming. I found it mutually beneficial for farmers, apprentices and volunteers to live and work together at the farm. The farmer can have people to work at the farm while the apprentices and volunteers can learn about crop production and farm business from the farmer.

At some farms, there were commuter volunteers who used to be their customers. The volunteers were helpful because they provided their time and labor for the farms. At the same time, the farm work inspired the volunteers to learn more about local food production and healthy eating.

Some participants with home or community gardens asked their sons or daughters for help with tiring work. It would be nice to get support from family if they live nearby. However, if they cannot get support from family, tools that eliminate a physical burden would be helpful. For example, a participant created a tool for sowing called “daikon spacer” (see Figure 2). The tool was a long handle with projections at the bottom. He pressed soil with the tool, and the tool made holes in the soil. Using the tool, he could mark where he was supposed to put seeds without bending his knees or back. He also had a tool for dropping seeds that looked like a long stick. He put a seed into a hole on the top of the stick and the seed dropped along the stick. Using the tool, he could drop seeds without bending his knees or back. I did not find that other participants used the same kind of the tools. However, it would be nice if the ideas about useful tools...
were shared within the Japanese communities.

Container gardening could be another solution for bringing down physical labor. Container gardening requires only small space, and there is no large space required for weeding or soil management. Containers are easy to move, and there is no worry about a lot of leftover produce. Disease and pest management would be easy for container gardening because there is less risk for diseases and pests. A participant explained the reason, saying; “it is common to use potting soil for container gardening. The potting soil is pest and disease free.” Another participant said; “container gardening is for small scale production. Thus, there is less density of pests and disease. It is also common to plant many kinds of vegetables together in container gardens. There is less exposure to diseases and pests transmitted by other plants.”
Although, in general, pots or vessels are famous for container gardening, jute bags would be alternative containers. One participant used jute bags for root vegetables, such as potato and daikon (see Figure 3). For root vegetable production, it is important to earth up the roots regularly so that the roots can be completely covered by the soil. For example, potato tubers turn green if they are exposed to sun while they are growing. In case of daikon, the roots need soft and deep soil so that the root will be straight and long. The participant found it easy and less labor intensive to earth up the roots in jute bags. The participant only pulled the sides of jute bags, and the soil moved upon the roots.

![Jute bag planting](image)

**Figure 3. Jute bag planting**

6.2.4 Preservation of Food Knowledge

Through the interviews and my observations of the Japanese communities, I found it important to address a question: how to preserve and transfer food knowledge to future generations. There has been an increasing interest in
growing and using Japanese vegetables and herbs for food preparation within
the Japanese communities. Through the interviews and my participation in the
Japanese community events, I met people of different generations who are
actively engaged in gardening and farming. For example, seniors were
knowledgeable about food from their life experiences. Families with children were
interested in knowing more about vegetable production. There were also young
couples who wanted to start growing vegetables in backyard gardens. However,
there were concerns regarding how to preserve food knowledge within the
Japanese communities.

There are some reasons behind the concerns. First, the form of Japanese
communities in the Lower Mainland and on Vancouver Island has changed over
the years. According to the literature review, before WWII, Japanese immigrants
lived in certain areas. There was a Japan town near Powell Street. There were
also big Japanese communities in Steveston and other areas in the Lower
Mainland. According to a few participants, even after WWII, Japanese immigrants
preferred to live in the similar areas. However, from my observations, the recent
Japanese communities are spread out in the Lower Mainland and on Vancouver
Island. There is no particular area where a lot of Japanese Canadians or
Japanese live.

A participant said that there used to be 400 Japanese immigrants in her
neighborhood when she immigrated to Canada. She said that there were many
cultural events and gatherings where seniors, adults, youth and children spent
time together. She remembered that these events were a good place to learn
many things from seniors. However, there are now only a few Japanese families in the area. She explained the reason, saying; “First and second generations of Japanese immigrants passed away. In addition, young people moved to urban area.”

Second, the family structure within the Japanese communities has changed. Most of the participants grew up in a big family. In their childhood, the participants lived with parents, sisters/brothers, and grandparents. Their relatives even lived nearby. The participants said that they learned about growing vegetables or cooking from their grandparents or parents. However, from the interviews and my observations, most of the participants were couples or families with children. Some participants even said that it was difficult to teach their sons and daughters about Japanese food because they preferred Western food to Japanese food.

There is less opportunity to learn about food from family and neighbors within the Japanese communities than before. The solution for passing food knowledge to younger generations within the communities is community events. There are many kinds of Japanese community events, such as summer festival, farmers market and New Year’s celebration. These events are not only for bringing people together and creating a sense of community, but also for displaying Japanese culture. In these community events, food is necessary because food is one of the important things that remind the participants about their culture.
These cultural events are a key to preserving and transmitting food knowledge within the Japanese communities. These cultural events provide access to local Japanese vegetables, the seedlings, and resources about gardening or farming. These events are good places where people of different generations can meet and learn about food culture and knowledge.

Another solution is workshops. In the interviews, when I inquired about community support that they wanted to see in their communities, some participants expressed their interests in gardening workshops. There were not many gardening or farming workshops within the Japanese communities. However, some participants were invited to study groups as guest speakers. They were asked to share their gardening experiences with other gardeners, farmers or people who were interested in gardening. Workshops are good venues for gardeners and farmers to share their knowledge with others, and also to connect with other gardeners and farmers. Workshops would also be good places for non-gardeners or non-farmers because they would learn about gardening or cooking from experts and re-discover food knowledge within the Japanese communities.

6.3 INTEGRATION WITH LOCAL FOOD SYSTEMS MOVEMENTS

This study also found the importance of transferring food production techniques and cooking practices from the Japanese communities to outside of the communities.
Municipalities have recognized the importance of including ethnic communities into local food system movements. Metro Vancouver’s regional food system strategy clearly states five goals to create a sustainable, resilient and healthy food system that ensures the economic growth, ecological conservation, and health of all residents (Metro Vancouver, 2011).

One of the five goals of the regional food system strategy is that “everyone has access to healthy, culturally diverse and affordable food” (Metro Vancouver, 2011, p. 35). This goal includes the importance of accessibility to culturally appropriate food especially in a region where the new immigrant population is growing (Metro Vancouver, 2011). However, communities of color are not fully included in local food movements (Gibb, 2011). There are no clear strategies about how to create better access to culturally diverse food.

This study showed that there was plenty of food knowledge within the Japanese communities. However, I was not sure how much knowledge was recognized, and if the knowledge was included in the local food movements. It is important to discuss how to transfer the knowledge of the Japanese communities to local food movements.

I have outlined some possible cases how knowledge of Japanese vegetable production could be incorporated into food related activities that have currently been promoted by local communities.

6.3.1 Urban Farming

Urban farming in Metro Vancouver has grown (Schutzbank, 2012).
According to the City of Vancouver (2013) “In Vancouver, “urban farming” refers to a site where fresh food is grown primarily for sale, or where the food is primarily consumed by someone other than the grower(s)” (p. 58). The benefit of urban farming is to provide local and fresh vegetables to urban citizens, to make a green space in a city and to generate employment in the communities (City of Vancouver, 2013; Schutzbanks, 2012). The current urban farmers in Vancouver are financially viable (Schutzbanks, 2012).

Japanese vegetables could fit for urban farming. This study demonstrated that some Japanese vegetables and herbs could be successfully grown in the Lower Mainland and on Vancouver Island. For example, daikon, kabu, shiso, komatsuna and other leafy vegetables are suited to cool and dry weather in summer. Seeds or seedlings of Japanese vegetables are easily accessible at local seed stores, Asian grocery stores or Japanese community events. There is also a growing market for Japanese vegetables and herbs. From my observations, some urban farms have already grown ethnic vegetables. Japanese vegetables and herbs could be introduced to more urban farmers to diversify their produce.

During my research, I did not see urban farmers within Japanese communities. Japanese communities could consider urban farming as an alternative land use to produce fresh and local Japanese vegetables and herbs. It would also be worthwhile to create connections with Japanese farmers and local urban farmers so that they can exchange skills and labors.
6.3.2 Community Gardens

According to the City of Vancouver (2013), “A community garden is a single piece of land gardened collectively by a group of people” (p. 53). Community gardens in Vancouver have grown tremendously. In 2011, 405 new community gardens were launched. It is estimated that there will be 5000 gardens by 2020 (City of Vancouver, 2012). The difference between a private garden and community garden is the ownership and access. Community gardens are owned and operated by the public (Seto, 2011). Community gardens differ from urban farming in a way that community gardens do not commercially produce food (City of Vancouver, 2013).

From my observation of community gardens in the Lower Mainland, community gardeners are people of all ages and from various cultural backgrounds. Community gardening enhances interaction between neighbors, promotes personal safety and health, and increases beauty in urban areas, through producing local food (Schukoske, 2000).

Community gardens also provide a place for intercultural learning. Many people of Japanese descent owned plots in community gardens in the Lower Mainland, and grew Japanese vegetables and herbs. The community gardeners introduced Japanese vegetables and herbs to other community gardeners. Because of influences from the Japanese gardeners, other community gardeners have started growing Japanese vegetables and herbs, such as shungiku and mizuna.
Community gardens also would be good for intergenerational learning. Community gardeners in this study found it educational to come to the gardens with children and take care of vegetables with them. The children became more interested in growing, cooking and eating vegetables after the hands-on experiences at the gardens. Community gardens could be a place where children or youth can learn about producing Japanese vegetables and herbs from their parents or neighbors.

6.3.3 School Gardens

The Vancouver Board of Education (VBE) has expressed the importance of school food gardens. According to the VBE School Food Garden Policy statement (Vancouver School Board, 2010), the objectives of school food gardens are to make fresher and healthier food choices, develop social skills, and improve green landscape. Another objective of the school food garden is to create hands-on learning opportunities in diverse subjects, such as math, science, nutrition and environmental education.

As mentioned, some Japanese vegetables and herbs have a long growing season, and can be grown during a school year. Some of the examples are komatsuna, syungiku and mizna. These leafy vegetables are cold tolerant and can be grown in fields in fall and winter. These leafy vegetables can also be cooked in a variety of ways, such as salad, pickles, stir-fry or hotpot. There are many recipes available for these leafy vegetables in cookbooks or websites. These leafy vegetables would be a good option for school food gardens.
The farmers and gardeners in this study had a lot of knowledge and experiences that are valuable to share with others. They were open-minded and happy to talk about how to grow and cook vegetables and herbs with others. Some participants were invited to Japanese community events, such as workshops or study groups, as guest speakers. School gardens would create a place where farmers and gardeners of Japanese descent could share their knowledge or experiences with students, and the students could learn about Japanese vegetables or cooking methods from the Japanese farmers and gardeners.

6.3.4 Farmers Markets

There are seasonal or year round farmers markets in the Lower Mainland and Vancouver Island. The benefit of farmers markets is to provide a space where local producers and consumers meet and sell/buy fresh, local and seasonal produce (Vancouver Farmers Market, 2012). Another benefit of farmers markets is that the markets consist of diverse producers and products (Vancouver Farmers Market, 2012).

The market for Japanese vegetables, herbs or food could be developed at farmers markets. In fact, some farmers in this study already participated in local farmers markets, and were successful in selling Japanese vegetables to local customers. In addition, local farmers’ markets would be a potential market for home gardeners or community gardeners. Almost all the home and community gardeners in this study had excess vegetables and herbs. Some home gardeners in this study successfully sold the excess vegetables, herbs, fruits or traditional
Japanese food at the Japanese community events. These vegetables or foods are hardly seen at the local farmers markets. Farmers markets would increase the diversity in vendors and products if home gardeners or community gardeners from the Japanese community participate in the markets as vendors.
7 CONCLUSION

7.1 OVERVIEW OF RESEARCH FINDINGS

The aim of this chapter is to provide an overview of my research project, highlighting key findings of the research and suggestions to the Japanese communities. The end of this chapter outlines research implications for local food system movements and future study.

This study is the first analysis of vegetable production within the Japanese communities in the Lower Mainland and on Vancouver Island. This study showed that the individuals from the Japanese communities here are actively engaged in gardening or farming activities. The participants in this study grew more than 80 kinds of vegetables, herbs and fruits. Although the participants mostly grew Japanese vegetables and herbs, they also cultivated Western and other Asian vegetables.

The participants were knowledgeable about growing vegetables and herbs, cooking and preserving their produce. There was a blend of traditional and modern aspects of food knowledge and practices within the Japanese communities. For examples, some participants used the seedlings and seeds from the earlier generation. The participants also followed the practices of preserving or cooking Japanese vegetables that they learned from their grandparents, parents or the earlier immigrants.

On the other hand, the modern aspect of food knowledge and practices was that the participants grew not only Japanese vegetables and herbs, but also
Western or other Asian vegetables. They were familiar with growing and cooking both Japanese vegetables and Western vegetables. Some participants also modified Japanese food recipes so that local ingredients could be successfully used in the recipes. During the cultivation of Japanese vegetables and herbs, soil, pest and weed management techniques were based on a wide range of resources, such as the knowledge gained from older generations of Japanese gardeners or farmers, the Internet or books.

This study identified the opportunities and challenges of growing Japanese vegetables and herbs in the Lower Mainland and on Vancouver Island in BC. Due ecological and social factors, the opportunity for growing Japanese vegetables and herbs is likely to increase. This study demonstrated that many kinds of Japanese vegetables and herbs were successfully grown in the Lower Mainland and on Vancouver Island. For example, komatsuna, mizna, daikon, kabu or shiso (see Appendix B) were well adapted to the cool and dry weather in summer in the Lower Mainland and on Vancouver Island.

Markets for Japanese vegetables and herbs have been increasing in the Lower Mainland and on the Vancouver Island because Japanese vegetables and herbs have become recognized among local customers. Demands for Japanese vegetables are not only from the Japanese communities, but also from people with various cultural backgrounds. There is even an increasing interest in growing Japanese vegetables and herbs among the customers of commercial farmers of Japanese descent.
However, there are some factors that limit Japanese vegetable production. In the Lower Mainland on Vancouver Island, temperatures are generally lower than that of Japan. The cold and wet fall and winter results in a short growing season. Although summer is a good season for gardening or farming, the cool and dry weather is challenging for successful cultivation of some vegetables, such as eggplant, edamame, or goya (see Appendix B), which require high temperatures.

Another factor is that the production of Japanese vegetables and herbs is labor intensive. Some Japanese vegetables are too delicate to withstand the use of mechanical tools. The participants had to use their hands or hand-powered tools for sowing, weeding, harvesting, washing and packing their produce. This type of work is challenging, especially for elder farmers or gardeners. In fact, the labor intensiveness and physical concerns were a major reason that discouraged some of the participants from expanding their farms or gardens.

This study also revealed that community involvement was strongly associated with gardening and farming activities among the participants. The participants in this study had a network with other gardeners and farmers. It was common among gardeners or farmers to exchange seeds, seedlings, produce and even knowledge about growing and cooking vegetables.

The community events were also a good place where the farmers and gardeners could sell their produce and share knowledge about gardening or farming. However, there is a concern regarding documenting, preserving and
disseminating food knowledge within the communities. This is because, compared to the past, there is now less opportunity to transfer food knowledge over generations within the Japanese communities. It would be interesting to see the growth of a network consisting of gardeners and farmers, and the creation of inter-generational learning opportunities within the Japanese communities.

Furthermore, this study assessed the importance of integrating the food knowledge and practices of the Japanese communities with the current local food system movements. Although local food system movements are growing in the Lower Mainland and on Vancouver Island, there is a lack of clear direction toward documenting and disseminating food knowledge within ethnic communities. It is important to expand opportunities where ethnic communities can get involved in local food system movements. This study outlined four possible cases: urban farming, community gardens, school gardens or farmers markets, where the food knowledge and practices of the Japanese communities could be transferred to the local food systems movements.

7.2 SUGGESTIONS TO THE COMMUNITIES

The participants in this study were knowledgeable about vegetable production, such as the growing season, composting, and pest management. There are only a few suggestions to the communities regarding production techniques. Gardeners are encouraged to make use of fabric row covers or mulch to protect plants from low temperatures or frost. Fabric row covers also could be applied in summer to protect plants from pests.
Container planting would be good for growing plants that require high soil temperature. This would also eliminate the labor intensiveness of gardening that was a major concern expressed by the participants. Use of a pot or a jute bag for gardening would be recommended for elderly gardeners or people who have physical concerns. Container planting does not have a big startup cost and would also be easy for beginners to start gardening.

There is also a suggestion regarding how to document, store and transfer food knowledge. Compared to the past, there is now less opportunity for transferring food knowledge within the Japanese communities. There is a need for places where the gardeners and farmers can share their knowledge and experiences of growing vegetables and herbs.

Community events within the Japanese communities are already successful in bringing together people from different generations, and displaying food culture and knowledge. Workshops and study groups would also be good venues for the gardeners and farmers to share their knowledge and experiences and to learn from each other. Workshops or study groups are open to public and beneficial for new gardeners or people who are interested in growing vegetables. The new gardeners can meet local farmers and gardeners and learn about food production from experienced farmers and gardeners through workshops or study groups.
7.3 RESEARCH IMPLICATIONS

7.3.1 Japanese Vegetable Production in the Southern Interior of BC

I did not include the southern interior of BC, such as Thompson Okanagan and Kootenay regions, for this study because of the limitation of my research timeline and budget. However, this study proposed a potential research opportunity regarding the production and marketing of Japanese vegetable and herbs in the southern interior of BC. During the interviews, I often heard about Japanese vegetable production in the Thompson Okanagan and Kootenay regions. Some participants said that they had seen many kinds of Japanese vegetables being successfully produced in the Thompson Okanagan and Kootenay regions, and bought the seeds from their friends or family who lived in the area.

According to the participants, there seems to be some advantages of growing Japanese vegetables in the Thompson Okanagan and Kootenay regions. These regions have higher temperatures in the summer than that of Lower Mainland and Vancouver Island. For example, in Kelowna, the average daily maximum temperature from May to August is 24.7°C. On the other hand, in Vancouver, the average daily maximum temperature from May to August is 18.65°C (Environment Canada, 2012a).

As mentioned, some vegetables, such as goya, edamame (see Appendix B) or eggplant, are difficult to grow in the Lower Mainland and on Vancouver Island because these vegetables require high temperatures to grow. However,
some participants knew that these vegetables were successfully grown in the Thompson Okanagan and Kootenay regions. There might be more kinds of Japanese vegetables and herbs available in the southern interior of BC.

Another point is that the southern interior of BC has a long history of Japanese immigrants. For example, in Kelowna, Japanese immigrants had worked as construction labors or farmers since around 1907 (Roy, 1990). In addition, during World War 2, the Japanese communities grew in the southern interior of BC because the Japanese had to move from the coast, as required by the government at that time (Yesaki, 2003). Because of the historical background, Japanese vegetables must have been grown in the southern interior of BC for a long time. In fact, one of the participants said that his family owned a farm in the southern interior of BC and grew Japanese vegetables.

Because of the environmental and historical backgrounds, there may be more kinds of Japanese vegetables and the seeds available in the southern interior of BC than that in the coastal region. Future studies should explore Japanese vegetable production in the Thompson Okanagan and Kootenay regions. The future studies may reveal different local knowledge about Japanese vegetables and herbs, and strengthen the limitation of this research.

7.3.2 Food Knowledge in Other Ethnic Communities in BC

This study also explored prospects of food knowledge of not only Japanese communities but also other ethnic communities. This study showed that there is a lot of knowledge regarding food production techniques and practices within the
Japanese communities in the Lower Mainland and on Vancouver Island. However, much of this knowledge had not been scientifically studied, and there was a lack of academic literature on the gardening or farming practices of the Japanese communities. This fact raised a concern about the underrepresentation of food knowledge, not only towards Japanese communities, but also towards other ethnic communities. It is assumed that there might be a lack of academic literature or resources regarding farming or gardening practices of ethnic communities in BC.

New immigrants from different land and origins increase the visible minority in the Canadian population. Canadians are increasingly exposed to a variety of ethnic foods (Serecon Management Consulting Inc, 2005). It is especially apparent in BC since this region is culturally diverse and there is a growing need for research interests regarding different ethnic foods in BC.

Municipalities aim to involve ethnic communities in local food movements. For the involvement of broader communities, it is recommended that food knowledge and traditional practices of ethnic communities be studied and documented. It is also necessary to have clear strategies for translating the knowledge into local food movements. As the knowledge of ethnic food increases, there may be better access to funds and infrastructure for capacity building within ethnic communities.
REFERENCES


APPENDICES

APPENDIX A: QUESTIONNAIRE USED IN RESEARCH

A DEMOGRAPHICS AND GENERAL INFORMATION

- How old are you?
  - Under 29, 30s, 40s, 50s, 60s, 70s, 80s, 90s, Over 100
- What is your gender?
  - Male  Female
- Which city, town, village or municipality do you live in?
- What does the community look like?
  - e.g. Demographic (characteristics of the residents), geography, culture and location
- How many are living at your home?
- Where are you originally from?
- How long have you been in Canada?
- Are you home gardener or commercial farmer?
- How many in your family are gardening or farming?
- What is the approximate size of your garden/farm?
- How long have you been doing gardening or farming?
- How long have you been growing Japanese vegetables?

B PRODUCTION

- What soil types exist?
  - e.g. Soil types (sandy, loam or clay), color (dark, moderately color or light), compaction (loosely compacted or dense and highly compacted), moisture content, organic content, pH (acidic or alkaline) and soil temperature
- What are topographical restrictions?
  - hills or flat
- If on hills, do slopes face north or south?
- Does your farm land/garden face north or south?
- How is the light intensity?
- Does it affect growing potential?
- Are there poorly drained spots?
- Is there a source for water irrigation?
- What soil management practices are required?
- Are fertilizer and compost input required?
- What crops and varieties do you grow, and why?
  - e.g. In spring_____, in summer_____, in fall ______ and in winter____
- How much yield do you produce?
- Do you plant seeds or young plants?
- Where do you obtain seeds/young plants?
- What characteristics do they have?
Do you have a nursery?
Do you store seeds and how?
How do you control pests, weeds and diseases?
Do you have a greenhouse or use a cold frame?
Are there any environmental constraints?
  o e.g. Concerns about causing pollution to watercourses or groundwater, and weather and growing season (frost-free days and early warming soil)

Questions for commercial growers only
  Does the agricultural operation require machinery?
    o e.g. Mechanical weeder, manure/compost spreader, fertilizer spreader and herbicide spreader
  Do you employ workers?
  If so, what do they do?
    o e.g. Thinning, pest and disease management, spray, nutrition application and mowing
  How do you store, package and distribute your produce?
  What are the major production inputs?
    o e.g. Fertilizer and manure inputs, pest and disease control inputs, machinery fuel and maintenance, marketing expenses, irrigation expenses pollination expenses
  Are there any regulatory restrictions in the production method?

MARKETING
  What types of market channel(s) do you use?
    o e.g. Indirect wholesale; direct retail
  If you use a direct marketing, how do you sell your produce?
    o e.g. Farmers markets, CSA(Community-supported agriculture), road side stands, phone-in orders and direct sale through local advertisement
  Where and how big is the market?
  What price can you sell your produce?
  Does the global marketplace affect the price?
  What influences the market demand look like?
    o e.g. Freshness, different production methods, unique varieties, quality, taste, size, shape, better service and convenience
  Is there the cost associated with the market?
    o e.g. Cost for shipping, packing, CSA and farmers market
  How do you promote your produce?
    o e.g. Advertising through local papers and radio, local farmers market association, signage, coupons, farm event and word of mouth
  Do you produce value-added products?
  If so what do you produce, and why?
What types of products might be in demand in your community?

What does the community look like?
  - e.g. Demographic (characteristics of the residents), geography, culture and location

HOME AND PERSONAL USE

What do you grow for home and personal use?
Do you grow year-round?
(If no) How do you use/manage your garden during no growing season?
Approximately what percentage of your household’s produce consumption comes from your garden?
  - e.g. In spring_%, in summer_%, in fall_% and in winter_%
Why do you grow food for home and personal use?
  - e.g. To practice traditional diet, to reduce household expenses to eat fresh and safe food or to enjoy hobby with family
What do you do with excess produce that household members do not consume?
  - e.g. Preserve, donate, compost, sell and trade
Do you compost, and how?
How and where do you learn and exchange knowledge about growing food? (if you do not pursue commercial production)
  - e.g. Informal verbal communications, verbally in an organized group, over the internet and phone or school
Do you want to do more, less or quit gardening?
(If more) why?
  - To try new species or sell excess produces
(If less or quit) What factors do you feel prevent you from doing more garden?
  - e.g. Space, money, water, require more knowledge, time, physical concern, poor soil quality or not interested
Do you have community services that you would like to see established in our community?
  - e.g. Community garden, greenhouse, fruit drying and processing equipment, composting facility, shared farm equipment, gardening workshops

CULTURAL USE

Do you grow food, plants or flowers that fit into cultural celebrations?
How are the food, plant and flower connected to your family and community?
What is the extent of traditional food use within the community?
APPENDIX B: FURTHER EXPLANATION OF JAPANESE VEGETABLES AND HERBS

**Adzuki**

Adzuki is adzuki bean. Adzuki is an annual plant with beans slightly smaller than soybeans. The color is dark red. Adzuki is mostly used for confectionery, such as bean paste or sugared beans. Adzuki is used for sekihan (glutinous rice steamed with adzuki) when people cerebrate something (Sakurai, 1986).

**Daikon**

Daikon is known as white radish and is one of the famous brassica vegetables. It is good for many kinds of pickle, salad, boiled and seasoned dishes, sashimi garnish, soup, sunomono (seasoned with vinegar based dressing) and topping for grilled fish and tempura. Daikon is also cut and dried as preserved food as kiriboshi daikon (Sakurai, 1986).

**Edamame**

Edamame is immature soybeans. The word of “Edamame” literally means “twig bean” because it is boiled without separating twigs. It is good source for protein and Vitamin C. Edamame is a popular side dish in summer, and goes well with beer. Edamame also can be cooked with soy sauce or sugar. Ground edamame is used for salad (Sakurai, 1986).
**Fuki**

Fuki is butterbur. It is an herbaceous perennial plant. Fuki is native to Japan and can be found everywhere in the countryside of Japan in spring. Fuki is famous for the strong bitter taste. It is important to remove the harshness before cooking by sprinkling salt on fuki and rolling it on a cutting board. Then, it is boiled in hot water and soaked in cold water. Fuki is used for stir-fried food or boiled with vegetables, mushroom or chicken (Kikkoman, 2011a).

The flower bud is called “fukinotou”. Fukinotou is one of the famous edible wild plants in early spring. It has a distinct bitter flavor. Fukinotou is good for tempura, salad or miso soup. Fuki miso is also popular dish in early spring. It is made by fukinotou and miso, and served with rice in early spring (Souma, 1996).

**Goya**

Goya is bitter melon. It originally comes from tropical Asia, and is widely grown in tropical and subtropical areas. Although goya is grown in certain subtropical areas, it is widely consumed through Japan. The size and color are varied. However, in Japan, goya has dark green skin and 20 -30cm oblong shape with warty surface. Goya has strong bitter taste, but it is a good source of Vitamin C. Goya is good for stir-fry, miso soup, fresh juice, pickles, and salads (GOHYAH-DAISUKI, 2002).
**Hotokenoza**

Hotokenoza is henbit. Hotokenoza is one of seven herbs of spring. The seven herbs of spring is important ingredients for nanakusagayu (seven herb rice porridge). In Japan, there is a tradition of eating nanakusagayu on January seventh of each year. This tradition came from the belief that nanakusagayu brings longevity and health in the coming year, and rests digestive systems (Kikkoman, 2013).

**Itadori**

Itadori, Japanese knotweed, grows in the wild in Japan. The young shoots are harvested in spring or early summer. The young shoots look like bamboo and have a strong sour flavor. It is important to remove the harshness before cooking by peeling the skins, boiling the shoots quickly, and soaking them in cold water for one night. The shoots are good for stir-fry, sunomono, or boiled salad. The shoots can be preserved by freezing or pickling with salt (Japanese Cuisine Study Group, 2011; Kagawa Agricultural and Fisheries Department, n.d.; Kumadoco.net, n.d.).

The young buds are also edible. The texture is crunchy and sticky. The young buds are boiled and dressed with sesame paste, mustard-miso dressing or miso-mayonnaise dressing. The young buds are also good for tempura (Akita Prefecture Tourism Federation, n.d.; Akita Rice Farm Satou House, 2012).
**Kabu**

Kabu is turnip. The size and color are varied (Sakurai, 1986). The root is spherical in shape, and used for pickles, miso soup, boiled and seasoned dishes or even cream stew. The leaves are also edible as a leafy vegetable. The leaves are good for pickle, simmered dishes or miso soup.

**Kabocha**

Kabocha is known as winter squash. It is native to the American continent. Kabocha was introduced to Japan in the 17th century, and has become one of the important vegetables to Japanese cuisines. Kabocha is rich in carotene. Kabocha is used for boiled and seasoned dishes. These days kabocha is also used for salad, cream soup, pudding, or pie. The seeds can be eaten as nuts, or extracted for the oil (Agriculture & Livestock Industrial Corporation, 2012; Sakurai, 1986).

**Karashina**

Karashina is also known as mustard greens. It has an extremely hot mustard flavor. Karashina is good for boiled and seasoned dishes, salad and many kinds of pickles. The seed is an ingredient for karashi, a Japanese condiment (Sakurai, 1986).

**Komatsuna**

Komatusna is a leafy vegetable that has pale green stems and deep green leaves. Green komatsuna is common in Japan, however, red komatsuna that has
wine red stems and leaves are grown in Canada. Komatsuna is good for boiled salad, miso soup, pickles and zouni (a soup with rice cakes for New Year’s day) (Sakurai, 1986).

**Mitsuba**

Mitsuba is Japanese honeywort. Mitsuba is a perennial plant of the lily family. The leaves look like parsley. Mitsuba grows naturally on hills, in fields and riverside in Japan. Mitsuba has a refreshing flavor and good for soup, boiled salads or hotpot (Sakurai, 1986).

**Mizuna**

Mizuna is a tall and thin leafy vegetable. The leaves are rough-edged. Mizuna was a famous local vegetable in Kyoto, in western Japan. The texture is crisp. Mizuna is used for salads, hotpot or boiled and seasoned dishes. Mizuna can be grown in cold season when there are not many vegetables available in Japan (Ashizawa, 2002).

**Myouga**

Myouga is Japanese ginger. It is native to Japan. The flower buds are harvested in summer. Myouga has a bitter flavor and used as a condiment or pickles (Sakurai, 1986).
Nazuna

Nazuna is shepherd’s purse. Nazuna is a plant of Brassicaceae family. Nazuna can be seen everywhere in Japan. Nazuna is one of seven herbs of spring in Japan. In January, nazuna is used for nanakusagayu (seven herbs rice porridge: see Hotokenoza) (Kikkoman, 2013). In spring, the young leaves and shoots are cooked in different ways, such as boiled salads or soup. The fresh leaves and shoots can be used for a garnish with meat dishes (Kuwahara Liquor Store, 2004).

Rakkyo

Rakkyo is shallot. The bulbs are harvested in summer and pickled with vinegar. In general, smaller bulbs have a better flavor. The pickles goes well with rice or Japanese curry (Skaurai, 1986).

Satoimo

Satoimo is eddoe. Satoimo is native to Southeast Asia. The corms and leaves are edible. The corms are sticky and good for soup or grilling (Sakurai, 1986).

Shiso

Shiso is known as Japanese basil or perilla leaves. The flavor and fragrance are distinct and go well with Japanese dishes. Shiso has two varieties: green shiso and red shiso. Green shiso is best appreciated raw with sashimi (raw fish), rice balls, noodles and salads. Red shiso is pickled with Japanese plums to make
umeboshi (pickled Japanese plum) (Kikkoman, 2011b).

The seeds are edible. The seeds are harvested in fall. Shiso seeds have a distinct flavor and crunchy texture. Shiso seeds are pickled with salt as preserved food. The pickled shiso seeds are mixed with other vegetables pickles or onigiri (rice balls) (Yamamoto, 2010).

**Shungiku**

Shungiku is chrysanthemum leaves. The leaves are deep green and tender. Shungiku has a slightly bitter flavor and is one of important ingredients for hotpot in autumn and winter. Shungiku is also good for boiled salad and seasoned dishes (Sakurai, 1986).

**Takana**

Takana is a variety of karashina. However, the stems are bigger and the leaves are thicker than karashina. The leaves are dark green and have fine hair. Takana has a pungent taste and is rich in Vitamin A. Takana is good for pickles.

**Udo**

Udo is a perennial plant native to Japan. It naturally grows in fields and on mountains in Japan. Udo has a distinct flavor. To remove the harshness, the stem is peeled and soaked in weak salt water. Udo is good for salads with mayonnaise, French sauce or vinegar. It is also used for pickles or boiled and seasoned dishes (Sakurai, 1986).
**Wasabi**

Wasabi is a member of the Brassicaceae family. The root has an extremely strong hot flavor. Wasabi is used as a condiment or pickles. Wasabi is also necessary for sushi or sashimi (raw fish) (Sakurai, 1986).

**Yomogi**

Yomogi is Japanese mugwort. It grows naturally in fields and mountains in Japan. Yomogi is rich in Vitamin A. The young leaves are used for rice case in spring (Sakurai, 1986). The young leaves can be used for cookie, bread or tea.