Strategies to enhance the integration of agri-culture with urban culture in British Columbia, Canada

Dr. Arthur Fallick, Sustainable Food Systems Working Group, Institute for Sustainable Horticulture, Kwantlen Polytechnic University, British Columbia, Canada
Food System Design and Planning in South-West British Columbia and the Yukon

Structure of the Presentation

1. **Sustainable Food Systems Working Group** of the Institute for Sustainable Horticulture - (applied research, new B.Sc. In Sustainable Agriculture, Richmond Farm School)

2. **Context** – BC’s Agriculture and the geography of the southwest region

3. **Current food system** (local and regional food system has been hollowed out)

4. **Our focus** – Planning FOR Agriculture – Land+Food+Community - (influenced by Thayer, Ikerd, Ehrenfeld, Benfield, et.al.)

5. **MESA** and **Bio-regional** concepts

6. **Progress** to date - Food System Design and Planning in South-West British Columbia and the Yukon
Bio-Control and Bio-Products for sustainable environments
(D. Henderson)

Sustainable Food Systems
(A. Fallick & K. Mullinix)

* Applied Research
* Extension Programs & Knowledge Transfer
* Contributions to Education Programs

Southwest B.C. and Yukon Research Team
Dr. Arthur Fallick - Kwantlen Polytechnic University (Co-Principal Investigator)
Dr. Kent Mullinix - Kwantlen Polytechnic University (Co-Principal Investigator)
Greg Harris - Kwantlen Polytechnic U.
Caitlin Dorward - Kwantlen Polytechnic U.
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Dr. Sean Smukler - University of British Columbia
Sara Barron - University of British Columbia
Lorenzo Magzul - University of Victoria
Dr. Lenore Newman - Fraser Valley University
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Marc Schutzbank - Research Associate
Katie Robinson - Research Associate

Special Project Advisors
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Dr. Alejandro Rojas - University of British Columbia
Dr. Scott Green - University of Northern B.C.
Ellen Pond - Pembina Institute
Our challenge as planners, developers and policy-makers of the built environment in an era of climate change is to figure out how to strengthen agriculture systems and the biodiversity of our farmlands, and connect them to livable communities and their consumers.

K. Benefield (2002)
Our research directly ties agriculture to the economic, social and ecological sustainability of communities.

Concept
Bio-regional food systems (design and planning)

Application
Municipally Enabled and Supported Agriculture (MESA)

Tools
- Community Trust Farming
- Farm Schools
- Sustainable production systems
- Green House Gas mitigation strategies

- Life Place (Thayer)
  - Eco-Region
  - Bio-region

- Land
- Food
- Community

- Ecology
- Economy
- Community

- Natural Capital
- Economic Capital
- Social Capital

- Feasible
- Viable
- Scalable
- Replicable

8/15/2012
Our research focus

MESA describes an approach in which Municipal governments take a lead role to enable or support the full integration of an agri-food system within the planning, design, development and function of human settlements. Beyond the municipal impacts, the **Bio-regional** concept advances food systems based on regional resource capabilities that respect ecological limitations, focus on and nurture place and community, and complement the global system by optimizing land and resource utilization through maximizing regional food self-reliance.
Quick Facts: British Columbia’s Agriculture Sector

- In southwest BC, people spend +$4.5 billion on food annually (pop = ~2.7 million in 2011)
- Farming is worth $9.6 billion, employing 60,000 people (producing & processing)
- The Agriculture sector lost ~$87 million in 2010
- We export $2.5 billion of agriculture products
- We import 85% of what we consume
- 38% of BC Farmers are 55+ years of age
- 50% of farm sales average less than $10,000 annually
- 41% of land farmed is leased or rented from the owners

- Over 82% of British Columbians live in urban areas
- 79% live in an area of less than 3% of B.C. (centred on the Okanagan Valley and south west corner of the Province).
- In this same small area about 78% of B.C.’s gross farm receipts are generated.
The primary value of British Columbia’s agricultural land relates to three key factors.

i. **Functionality** - its ability to provide for one of the most basic of human needs.

ii. **Production** from these lands makes an important contribution to the Province’s economy, defines part of the Province’s social fabric and creates a valued visual characteristic.

iii. In many areas the agricultural land base is of high quality but quite limited in quantity - only about 5% of B.C.’s land is in the **Agricultural Land Reserve (162,000ha)** and only 1% has prime agricultural capabilities.
The local / regional food system is being hollowed out as we increasingly rely on a global, industrial agriculture model. The implications for food security, food self-reliance and ultimately, the sustainability of our communities require careful consideration.
Historically | Currently
---|---
Abundant Farmland | Scarce and very expensive Farmland ($250k+/acre)
Family Scale Farming | Industrial Scale Farming (Quotas)
Crop Diversity | Berries + hothouse flowers + vegetables Production for Export
Production for Local Consumption | Agricultural Land Reserve /Edge issues

Table 1 | Crop production in Metro Vancouver, 2006

<table>
<thead>
<tr>
<th>Crop type</th>
<th>Land area (ha)</th>
<th>% Change 1996–2006</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1996</td>
<td>2001</td>
</tr>
<tr>
<td>Berries</td>
<td>3300</td>
<td>3940</td>
</tr>
<tr>
<td>Blueberries</td>
<td>1506</td>
<td>1746</td>
</tr>
<tr>
<td>Cranberries</td>
<td>1218</td>
<td>1505</td>
</tr>
<tr>
<td>Strawberries</td>
<td>204</td>
<td>227</td>
</tr>
<tr>
<td>Raspberries</td>
<td>318</td>
<td>200</td>
</tr>
<tr>
<td>Vegetables</td>
<td>2639</td>
<td>3175</td>
</tr>
<tr>
<td>Potatoes</td>
<td>2097</td>
<td>2085</td>
</tr>
<tr>
<td>Green/wax beans</td>
<td>444</td>
<td>627</td>
</tr>
<tr>
<td>Sweet corn</td>
<td>366</td>
<td>469</td>
</tr>
<tr>
<td>Squash/pumpkin/zucchini</td>
<td>186</td>
<td>308</td>
</tr>
<tr>
<td>Lettuces</td>
<td>271</td>
<td>282</td>
</tr>
<tr>
<td>Cabbage</td>
<td>161</td>
<td>197</td>
</tr>
<tr>
<td>Carrots</td>
<td>182</td>
<td>259</td>
</tr>
<tr>
<td>Spinach</td>
<td>29</td>
<td>58</td>
</tr>
<tr>
<td>Celery</td>
<td>46</td>
<td>20</td>
</tr>
<tr>
<td>Rutabaga/tumip</td>
<td>39</td>
<td>44</td>
</tr>
<tr>
<td>Chinese cabbage</td>
<td>74</td>
<td>96</td>
</tr>
<tr>
<td>Nursery crops</td>
<td>1113</td>
<td>1235</td>
</tr>
</tbody>
</table>

In southwest BC, the relationship between settlement patterns and the need for land suitable for growing food has resulted in many of our urban centres being built on the best agricultural land in the region.
Regional Food Systems Design Methodology

Phase One
- Geographic (Bioregion) Context
  - Environment: geography, natural resources, climate, soils, water, energy, biodiversity
  - Economy: population, employment, supply/demand, import/export, transportation, infrastructure
- Socio-Cultural: community, culture, First Nations, public health, governance, policy & planning
- Food: production, provisioning, processing, distribution, consumption, waste management

Phase Two
- Food System Design
  - Design of each FS component is informed by domain research and key indicators
- Food System Components
  - Provisioning, production, processing, distribution, consumption, waste management

Phase Three
- Governance Structures, Policy Objectives, Principles, Planning, Monitoring and Evaluation Plan

Platform of Sustainability: Environmental Integrity, Economic Integrity, and Socio-Cultural Integrity

Evaluation of Potential
- Specific evaluation will be informed by community engagement, design elements & sustainability platform

Food Security, Food Sovereignty, Resilience, Social Capital, Policy Environment

Institute for Sustainable Horticulture: K. Mullinix, A. Fallick, C. Dorward | DRAFT 7/10/2012; Not for Distribution
Key objectives

Support agriculture and food provisioning by:
- Connecting agriculture with key elements of the food system (processing, distribution, sales);
- Providing region-specific information for current and future farmers;
- Attracting and preparing new farmers;
- Delineating climate change adaptation strategies for agriculture; and,
- Identifying opportunities and strategies for expanding the regional food sector.

Strengthen the regional economy by:
- Retaining more of the “local food dollar” and positioning the food sector to contribute directly to the regional economy;
- Creating opportunities for small to medium sized businesses; and,
- Creating rewarding, satisfying jobs that will appeal to a new generation.

Promote environmental stewardship and health by:
- Mitigating environmental degradation and lessening overall ecological footprints;
- Contributing to regional greenhouse gas emissions reductions;
- Promoting energy efficiency within the food sector; and,
- Integrating ecologically sound agriculture with productive natural landscapes.

Foster food security and public health by:
- Making healthy, fresh, culturally appropriate foods readily available; and,
- Substantially reducing reliance on imported foods.

Strengthen communities and build social capital by:
- Building capacity within SWBC communities to engage in agriculture and the food system; and,
- Bringing together diverse communities by catalyzing action around mutual goals and shared food system values;
Regional Food Systems Design Methodology

Phase One
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System Baseline

Phase Two
Food System Design
- *Design of each FS component is informed by domain research and key indicators

Food System Components
- Provisioning
- Production
- Processing
- Distribution
- Consumption
- Waste Management

Design Elements
- Ecology
- Economics
- Community Dynamics
- Health & Nutrition
- Resource Systems
- First Nations Planning

Evaluation of Potential
- *Specific evaluation will be informed by community engagement, design elements & sustainability platform
- Food Security
- Food Sovereignty
- Resilience
- Social Capital
- Policy Environment

Platform of Sustainability: Environmental Integrity, Economic Integrity, and Socio-Cultural Integrity

Phase Three
Implementation and Ongoing Evaluation
- Governance Structures
- Policy Objectives
- Planning Principles
- Monitoring and Evaluation Plan

Institute for Sustainable Horticulture: K.Mullinix, A.Fallick, C.Donward | DRAFT 7/10/2012; Not for Distribution
Baseline Assessment
# Food System Design

<table>
<thead>
<tr>
<th>Vision</th>
<th>Goals</th>
<th>Objectives (Non-Prioritized)</th>
<th>Indicators</th>
<th>Related Domains</th>
</tr>
</thead>
<tbody>
<tr>
<td>A food System that is ecologically, economically and socially resilient and provides primary, secondary and tertiary food security.</td>
<td>Significantly contribute to overall health and improved nutrition and the mitigation of diseases</td>
<td>1. Provides food choices that meet the population’s recommended nutrition requirements and prevent food related chronic diseases</td>
<td>Community Health</td>
<td>Community Health</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Ensures that food is safely produced and safe to consume</td>
<td>Economy Dynamics</td>
<td>Community Dynamics</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Promotes healthy eating behaviours by offering basic nutrition education and health promotion</td>
<td>Production/Pre-Production</td>
<td>Community Health</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Ensures food is affordable</td>
<td>Community Dynamics</td>
<td>Community Health</td>
</tr>
<tr>
<td></td>
<td>Enable resilient and sustainable ecological function</td>
<td>5. Maximizes internal material recycling and minimizes material loss</td>
<td>Ecology</td>
<td>Supply Chain</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6. Maintains and enhances biodiversity on and off the farm</td>
<td>Ecology</td>
<td>Supply Chain</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7. Optimizes soil, water, and air quality</td>
<td>Ecology</td>
<td>Supply Chain</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8. Results in a net energy gain</td>
<td>Ecology</td>
<td>Energy</td>
</tr>
<tr>
<td></td>
<td>Mitigate GHG emissions and increase the adaptation of food systems.</td>
<td>9. Mitigates Greenhouse Gas emissions and is adaptable to climate change</td>
<td>Ecology</td>
<td>Energy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10. Supports economically viable farms and ancillary businesses</td>
<td>Economy Dynamics</td>
<td>Land-Use Planning</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11. Creates income that circulates within regional economy</td>
<td>Economy Dynamics</td>
<td>Supply Chain</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12. Creates food system jobs</td>
<td>Economy Dynamics</td>
<td>Community Dynamics</td>
</tr>
<tr>
<td></td>
<td>Significantly enhance the regional economy</td>
<td>13. Satisfies regional demand for as many wild foods and cultivated crops and stock as possible.</td>
<td>Supply Chain</td>
<td>Supply Chain</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14. Ensures sufficient local services and infrastructure to support the provisioning of wild and cultivated food from the region year round</td>
<td>Supply Chain</td>
<td>Transportation</td>
</tr>
<tr>
<td></td>
<td>Maximize regional self-reliance</td>
<td>15. Optimizes and balances food, forage and feed production within the region in relation to urban settlement and community demands</td>
<td>Supply Chain</td>
<td>Land-Use Planning</td>
</tr>
<tr>
<td></td>
<td></td>
<td>16. Supports adequate infrastructure to support the food system</td>
<td>Community Dynamics</td>
<td>Community Dynamics</td>
</tr>
<tr>
<td></td>
<td>Create strong and resilient communities</td>
<td>17. Supports food preferences and cultural food choices</td>
<td>Community Dynamics</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>18. Supports development of social capital and strengthens community dynamics</td>
<td>Community Dynamics</td>
<td>Community Dynamics</td>
</tr>
</tbody>
</table>

8/15/2012
Dynamic Forces

Population Growth
Rapid Urbanization
Energy Consumption
Climate Change

Credit: Tara Moreau

Is the Lower Mainland going under?

Global warming has already triggered a sea level rise that could reach between 6–25 metres. We have 20 years to reduce carbon emissions or climate change will become irreversible. 

Credit: Tara Moreau
The expansion of urban and peri-urban agriculture in our region ranges in scale from grass-roots activism such as community gardens, SPIN farming (small plot intensive farming) and farmers markets, through design parameters such as green roofs and edible landscaping, to public policy initiatives such as Food Policy Councils, Sustainability Charters, Regional Growth Management and Regional Food System Strategies, and the Agricultural Land Reserve legislation enacted by the Government of British Columbia.

# Performance Measures

## Goal 1: Increased Capacity to Produce Food Close to Home

1. Total hectares of land in the ALR in Metro Vancouver
   - 1a. Annual number of hectares excluded from the ALR
   - 1b. Annual number of hectares included into the ALR
   - 1c. Annual number of hectares approved for non-farm use in the ALR
2. Total hectares of land categorized as farm property
3. Estimate of the amount of actively farmed land in Metro Vancouver
4. Average age of farmers in Metro Vancouver

## Goal 3: People Make Healthy and Sustainable Food Choices

1. Proportion of Metro Vancouver residents that eat fruits and vegetables 5 or more servings per day
2. Proportion of Metro Vancouver residents with an overweight or obese self-reported Body Mass Index (BMI)
3. Proportion of Metro Vancouver residents with Type II Diabetes
4. Number of schools in Metro Vancouver participating in “Agriculture in the Schools”

## Goal 4: Access to Healthy, Culturally Diverse and Affordable Food for Everybody

1. Annual cost of a nutritious food basket as a proportion of median income for a two parent family with two children in Metro Vancouver
2. Annual cost of a nutritious food basket as a proportion of after tax Low Income Cut-Off for a single parent family with two children in Metro Vancouver

## Goal 5: A Food System Consistent with Ecological Health

1. Number of farmers participating with Environmental Farm Plans in Metro Vancouver
2. Fish habitat health indicator
3. Percentage of food waste diverted from disposal
Agricultural, residential and commercial land uses must be integrated in the process of redesigning an efficient food distribution system for a world running out of fossil energy. If we continue to allow parcels of land to be allocated to their highest economic use, enough productive land simply will not be left in the right places to meet the food needs of future generations.

Our research illustrates how local governments can support local-scale, human-intensive, environmentally sound agri-food systems that can have direct and positive impacts on local and regional economies, protect and preserve farmland against urban sprawl and promote increased food production, distribution and consumption self-reliance.
Economic, Job Creation, and Food Production Potential on Underutilized Agricultural Land In Surrey, British Columbia
The goal is not the creation of a global economy, but rather a global network of regional economies.