A North Okanagan Food System Plan

Strengthening the Regional Food System

Prepared for

The Regional District of the North Okanagan

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TABLE OF CONTENTS

Executive Summary

Redesigning and strengthening the North Okanagan regional food system, with a focus on both economic and social links, is seen as a proactive way to address concerns around food safety and accessibility and the health issues related to diet and nutrition. At the same time, a strong regional food system will support local farmers and rural economies, maintain rural landscapes, improve access to local, fresh food, protect the environment, and contribute to a sense of pride in the uniqueness of the North Okanagan Region.

The goal of food system planning is to help the region move towards increasing food security and food self-reliance by building a more sustainable, economically viable and resilient regional food system. The way to achieving this will not be easy to define. The regional food system is complex and its components are strongly linked and interdependent. The system is also dynamic, influenced by such things as changing economic issues, environmental needs or constraints, climatic impacts, energy costs and community priorities.

However, a shared understanding of the issues around strengthening our food system will help to establish future strategic direction. As such, this plan identifies many of the existing assets and opportunities of our regional food system, while also examining the gaps, needs and barriers to a more sustainable and resilient food system. This document is a beginning foundation from which citizens, community groups, government, the business community, and the agricultural sector can continue the work of strengthening our regional food system and increase its resiliency. The forging of dynamic, collaborative relationships and partnerships will be critical to the success of the implementation of the recommendations that come from this plan.

Given the substantial number of issues related to our complex regional food system, this report focuses only on some of the key issues for the region. These have been organized into three different sub-sections –the agricultural sector, health and the consumer, and resiliency. Each sub-section provides an overview of our regional assets and/or initiatives in place or pending, and an overview of the challenges to be overcome in the process of building a stronger, more resilient food system. Successful models, tools or initiatives from other jurisdictions have been included wherever possible. In addition, each sub-section provides recommendations for initiatives that could move the region forward in food system planning.

The Agricultural Sector

Just less than 10% of the total area of the North Okanagan Regional District (RDNO) is currently being farmed. The region supports a diversity of production, from pasture for livestock grazing, grains, fruits and vegetables and a variety of livestock production. Organic production in the region includes market gardens, orchards, feed crops, cattle and chicken operations, as well as a bison and deer farm.

The long-term sustainability of our agricultural sector is faced with a number of challenges. The arable land base in the North Okanagan is under extreme threat as market forces substantially increase the value of the land for development. This has led to increasing numbers of applications for exclusion from the Agricultural Land Reserve. For many, the high cost of land, combined with the challenge of generating income from farming, makes entering into farming impossible - this is a key issue since many of our current farmers are nearing retirement. Another serious issue for farmers is the shortage of seasonal farm workers.

Several recommendations are put forward to support the protection of the agricultural land base and its productivity, including the following:

- Explore and support community agriculture opportunities (e.g., land trusts)
- Encourage the planning of appropriate agricultural/urban buffers and the creation of a 'no net loss of ALR lands' policy.
- Encourage jurisdictions to consider non-farm use applications to the ALC only when the proposed use is supportive of the food system.
- Find ways to provide training, resources, assistance and credit for beginning farmers and youth interested in farming and food-related careers.
- Consider the feasibility of creating a farm labour pool and other ways to address to labour issues (including housing).
- Explore strategies to enhance food production resiliency.

Water is critical to food production in the North Okanagan and the provision of supplemental water to crops through irrigation has enabled higher production and a greater range of crops to be grown. The Okanagan Basin Water Board (OBWB), of which the RDNO is a part, represents an evolving and unique model for water governance in the province. The OBWB provides leadership to local government in the coordination of basin-scale water management and helps the region prepare for population growth, development and climate change impacts on water supplies. The Okanagan Water Stewardship Council, an advisory committee to the OBWB, has recently completed an *Okanagan Sustainable Water Strategy Action Plan*. Also, the *Okanagan Water Supply and Demand Project* is currently underway and is expected to be complete in 2009. Both documents will have a tremendous influence on water management decision-making in the entire watershed.

The *Okanagan Sustainable Water Strategy Action Plan* recommends that an Agricultural Water Reserve be established for all lands in the ALR and all lands zoned for agriculture. It is also recommended that the current licensing structure be amended so as to allow for later-season and part-season irrigation, thus providing for better use of water by farmers. It is also recommended that support be given to initiatives that increase irrigation efficiencies.

A significant amount of food is imported into most B.C. communities. It is estimated that the average food import in Canada travels approximately 4,500 km before being consumed. 'Food miles' have many implications with respect to our region's dependency on energy, our ability to access fresh foods, our increasing reliance on food packaging and processing, our development patterns, local economy and regional identity. Though we often speak to our country's 'cheap food' policy, these food miles represent many hidden, economic, social and environmental costs that fail to be factored into the actual price of food.

The currently dominant food system relies heavily on fossil fuels for the production, packaging and distribution of food. This represents a significant contribution to our region's greenhouse gas emissions and a negative impact on our air quality and our citizens' health. As we consider the reality of the imminent decline of the world's oil reserves, it is becoming increasingly important that our food is produced in a sustainable manner much closer to home.

There are a number of direct marketing initiatives in place in the region, which reduce food miles and increase resilience in the system. The region has several seasonal farmers' markets, on-farm markets and community supported agriculture programs (CSA's), all of which support positive farmer-consumer relationships and allow farmers to earn 100% of the retail value of their products. The region also supports some grocery stores and foodservice operations that purchase local product from larger commercial producers, when available.

There is currently a *Good Food Box* program, a fruit and vegetable cooperative comprised of hundreds of families, available in the region. The program has continually struggled to maintain itself and has recently begun to be supported by the Food Action Society, which can help with fundraising and promotion so that a coordinator can continue to build and maintain the program.

The tree fruit industry is served by co-operative grading, packing and storage facilities. The co-operative also handles the marketing function for the Okanagan tree fruit crop, including sales of off-grade fruit to various processors. However, the region is currently lacking coordinated vegetable handling, storage and distribution facilities. Local farmers have expressed an interest in a cooperative box program that would be located in a centralized warehouse distribution centre.

The medium-sized operations in the region are particularly lacking in distribution and marketing channels because they tend to be too large to have the time to do direct market sales yet are too small to consistently supply a retail grocery.

The following are recommended ways in which distribution can be improved in the region:

- Create a centralized warehouse distribution centre that includes storage and extends the farmers' market season. It could involve specific contracts with a selection of growers that would manage the supply.
- Conduct an assessment of regional consumer demands (i.e., assess the market potential for regionally produced foods).
- Identify infrastructural gaps and other barriers that prevent local and regional farmers from marketing more of their crops, livestock and value-added products within the region.

The challenge for a regional food system is to develop a local food producer-consumer relationship through a healthy food processing sector, which provides jobs and economic growth. Since the majority of agricultural products are perishable, processing is one way to extend food supply throughout the year in a variety of forms. It is through the distribution and processing aspects of the food system that the most value is "added" to food, thereby increasing profit margins beyond that of raw, unprocessed food.

Small and medium-sized processors in the province are faced with competition from external processors and consolidation within the domestic industry. However, changing demands of consumer and food service markets, especially hotel, restaurant and institution buyers, may represent an emerging opportunity for small and medium-sized food processors.

Other challenges facing the processing sector include fluctuations in supply that result from poor weather and regulatory issues that have made the path towards cost efficient, smaller scale processing and distribution to local markets more onerous.

Recommendations for ways to enhance the processing sector include:

- Encourage the use of commercial kitchen facilities in the community that could provide small entrepreneurs with opportunities to build their businesses and develop job skills.
- Ensure that agricultural processing is included in industrial land use planning.
- Pursue an industrial retention policy that both preserves land for food processing uses and that plans for infrastructure upgrades so that food processing companies can maintain high levels of productivity and innovation.
- Assess the current small scale processing in the region (other than meat, which has already been completed) and determine the potential for expansion of local food processing.
- Continue to collaborate with the provincial government to streamline the food processing requirements for custom meat slaughter facilities.

Waste management is one of the most critical environmental issues associated with our food system. Local and regional food distribution systems, combined with composting programs and efforts to reduce food packaging, can help combat the inefficient use of land and energy resources. In considering how to strengthen our regional food system, we must consider ways in which we can reduce the waste stream heading to our landfills, as well as ways to support farmers to deal with the waste that is created during agricultural production.

The RDNO completed an Organic Waste Strategy in 2008, as part of an overall solid waste management strategy. It consists of thirteen specific programs that focus on reducing the amount of organic waste that requires centralized management, the collection of organic wastes, and the processing of organic wastes. Other components of the overall solid waste management strategy, specifically education and outreach programs, will encourage waste generators to reduce consumption of resources and otherwise change their personal habits to reduce generation of waste.

There are several on-farm composting facilities in the region that deal with farm-generated slaughter wastes. Rendering remains an alternative for disposal of slaughter waste, however, with BSE, it has become a very expensive disposal option. As a result of the new BSE-related requirements and the lack of cost effective local handling alternatives, slaughter waste has moved from being a net income generator for processors (when it could be shipped to a local rendering facility) to a significant expense. This represents a further burden for small-scale cattle producers in the region, who are finding the combined higher costs of production, slaughter and waste disposal increasingly difficult to overcome.

It is recommended that we determine the opportunities and barriers to providing cost-effective facilities or alternatives for slaughter waste.

In all aspects of the food system, there exist opportunities for economic development and contributions to a "green jobs" economy, especially as public concern grows over the health, safety and ecological impact of the industrial agricultural sector and its food product.

Large industrial farms and industrial scale food processing enjoy economies of scale in food production and processing. As food production becomes more technologically sophisticated, farmers are able to yield high levels of crops. Yet this technology is expensive, thus making it out of reach for all but large-scale farms. In the North Okanagan, like other rural areas, the impact of falling agricultural commodity prices, rising input costs (e.g., equipment, labour, gasoline), shifting trade dynamics, and regulations are adding to the challenge faced by small producers. We are seeing drastic declines in farm numbers as a result.

Recommendations for developing economic opportunities within our regional food system include the following:

- Explore business models that link farmers to larger volume markets and determine the barriers to the implementation of these business models.
- Create local government policy that would help with the location/expansion of urban food production and processing opportunities (e.g., streamlining fees and permitting process).
- Investigate the potential for a wholesale market that incorporates food processing.
- Develop an incubator program to connect job training and food (e.g., tie urban food production and processing together into an entrepreneurial urban agricultural and kitchen incubator).
- Through collaboration and partnerships with all levels of governments (local, provincial, and federal), community groups, and private industry, promote and support economic development initiatives related to agri-tourism and culinary tourism.
- Encourage all local business to be a part of the regional food system through purchasing and promotion of local food.
- Support local producers to market their products online.

Policy and planning tools can help to create new opportunities and tailor existing ones so as to strengthen a regional food system. A food system plan such as this one can be used as a tool to better understand the connections between food system mechanisms and outcomes, which can then be used to formulate policy and activities to help achieve desired outcomes. Policies can be developed to address any number of issues related to the food system. Governments at all levels are adopting policies in regards to healthy communities and food systems.

In our region, the RDNO has begun the process for a Regional Growth Strategy. The strategy will focus on several key growth issues, which were identified by elected officials, the broader community, interest groups and planners in the region. One of the key issues identified was ‘Agriculture and Food Systems’.

City of Vernon’s Official Community Plan (2008) is based on Smart Growth principles and includes a section on Agriculture and Food Access. In 2008, the City of Vernon Council resolved to consider adopting a Community Food Charter and to support Food System Planning in the Regional Growth Strategy. The city has since provided funding for the development of a food charter and food policies. This is currently under development and is expected to be presented to Vernon City Council in early 2009.

The Regional District of the North Okanagan (GVAC) has received funding from the Union of BC Municipalities to complete a Healthy Food and Beverage Sales initiative in public buildings.

The Township of Spallumcheen has an Agricultural Area plan. The District of Coldstream is in the process of creating a plan and the City of Vernon will begin its Agricultural Area planning in early 2009.

The City of Armstrong has received funding through the Union of BC Municipalities Community Health Promotion grant to implement a community garden and explore food security and food systems planning.

It is recommended that all jurisdictions:

- Develop and implement a Food Charter (or Food Policy), which will provide a broad vision and set of principles designed to lead towards greater food security and food self-reliance for the community and enhance the health of residents.
- Integrate food system planning and policy development with other government services.
- Collaborate with businesses to establish local food purchase policies that will promote health and improve the local farm economy.

It is also recommended that a Regional Food Policy Council be created and that consideration be given to the creation of a contract position of a Food System Planner.

A key goal for any community or region striving to enhance the strength and resiliency of its food system is to encourage and support sustainable farming practices and land stewardship. Environmentally responsible practices and the use of appropriate technologies will help to protect the land, air and water resources, protect the ecological services provided by farmland, while also enhancing the effectiveness and competitiveness of agricultural operations. The provincial Environmental Farm Planning Program provides excellent opportunities for farmers to improve farm profitability, identify environmental opportunities and risks on their own land, and to reduce conflicts between agriculture and environmental interests.

The term urban agriculture refers to any agricultural production that takes place within the urban and peri-urban region. Urban agriculture has many beneficial functions such as entrepreneurial food production, recreation, education, neighborhood beautification, gathering spaces, and community building. It also contributes to a sustainable urban environment by improving soil and air quality, supporting biodiversity by providing habitats for insects and birds, and reducing high temperatures caused by the heat island effect.

Additionally, growing and distributing food within cities decreases energy needs and the costs associated with the long distance transportation and conventional growing methods of food. Community urban food production attempts to maintain a sustainable food chain within a shorter area by producing, processing, selling, and composting food within a neighborhood or city.

It is recommended that all municipalities in the RDNO support and encourage urban and peri-urban agriculture through food system planning, including the following:

- access to grocery stores in the development and redevelopment of neighborhoods
- density bonuses and tax credits for developers who incorporate urban agriculture or food markets into their designs
- the creation of urban agriculture guidelines
- the support of leasing vacant or under-utilized publicly-owned land to growers
- the use of buildings (roofs, walls, balconies) for food production
- incorporate urban gardens and rooftop gardens into integrated stormwater management plans
- bylaws that permit a limited number of laying hens in urban backyards

It is recommended that, through collaboration and partnerships with all levels of government (local, provincial, and federal), community groups, and private industry that the following initiatives be implemented:

- Community and neighborhood gardens
- Introduction of edible landscapes on private and public space (including boulevards and neighborhood greenways)
- Urban agriculture on under-utilized public land and in private developments
- Green roofs and rooftop gardens, where appropriate
- The development of urban agriculture pilot projects on public property
- the application of land trusts and conservation covenants for private and public lands in urban areas dedicated to food production

Health and the Consumer

Given the connection of health and diet, it is important that healthy foods are accessible and affordable for all members of a community. A stronger and more sustainable regional food system would be inclusive and provide the means and tools to enable a healthier and a more regional diet for local consumers. Increasing accessibility to healthy foods will also benefit the region economically. When people are eating well, it builds social capital and improves health and vitality of individuals and the community. Conversely, the healthcare costs of diet-related chronic disease can place a significant burden on governments and taxpayers. Additionally, a poor diet can limit a person's ability to contribute to the community, or even perform the tasks of daily living.

Food security is a term that refers to the ability of all people to obtain a healthy diet. A widely accepted definition of food security is as follows:

> ***"Community food security exists when all citizens obtain a safe, personally acceptable, nutritious diet through a sustainable food system that maximizes healthy choices, community self-reliance and equal access for everyone."***

The *Food Security Assessment and Action Plan* was completed for the North Okanagan region in 2007. It provides detailed information on the issues related to food security in the region, while providing strategies and actions that would result in greater food security for the residents of the area.

Some of the key issues identified in the report include:

- the many challenges facing local farmers
- limited access to healthy and local foods (particularly for low income earners)
- under-resourced community food programs
- few, if any, supportive municipal policies related to the food system

The North Okanagan Food Action Coalition was able to hire a part-time coordinator to begin implementation of the top priorities that came out of the Food Security Assessment. The initiatives currently underway or completed since the assessment include the following:

- Formation of the North Okanagan Food Action Society
- Charitable food recovery efforts have focussed on ways to provide a higher proportion of fresh and healthy foods to recipients of charitable food.
- Local food producers have begun exploring possible systems to increase the availability of local food beyond the farmers' markets as well as consider market mechanisms to make extending the growing season financially viable.
- Input to the School District #22 Healthy Living Policy.
- Eat Local 101, a newspaper column to raise community awareness on the issues and benefits of eating locally ran from May to September 2008 in the local Morning Star newspaper.
- Food policy and planning recommendations were presented to the City of Vernon.
- A Community/School Garden was established as a pilot project in the East Hill/BX area in 2008.
- City of Vernon's newly adopted Official Community Plan (2008) is based on Smart Growth principles, which includes an emphasis on creating complete, compact communities. The OCP also emphasizes increased access to alternative transportation.
- The City of Vernon has created an Affordable Housing Committee, which is tasked with implementing the city's Attainable Housing Strategy.
- The Partners in Action Committee continues to make great progress in implementing its Homelessness Strategy (Social Planning Council of the North Okanagan 2007).
- The City of Armstrong has received funding through the Union of BC Municipalities Community Health Promotion grant to implement a community garden and explore food security and food systems planning.

Opportunities to further improve food security in the North Okanagan include the following:

- Expand affordable/attainable housing strategies to include all regional communities, where possible.
- Encourage municipalities within the North Okanagan to adopt policies that provide for garden and food storage space and/or edible landscaping in new or renovated higher density residences.
- Ensure all jurisdictions develop land use plans that consider transportation and community design in relation to food access.
- Consider provision for community gardens, smaller farmer "pocket" markets, and edible landscaping in neighbourhood and park development and design – particularly where access is already limited.
- Assist with providing space, infrastructure, and municipal resources to allow for a *regional* community garden network.

Food literacy is a general term used to describe the knowledge and skill-building abilities needed to provide capacity within households to enable more food self-reliance, food security, and facilitate a fresher, more local diet. It includes an understanding of healthy eating and nutrition, as well as the various skills needed to obtain,

cook, and preserve the food. Food literacy includes understanding nutrition labels and choosing appropriate foods for particular needs.

While many community food programs have been or are currently operating in the RDNO, the region lacks consistent funding or consistency in programs offered across the region, even though there is need and interest in having them available. The newly formed *Food Action Society of the North Okanagan* serves to umbrella the community food programs of the region, however there is no core funding or paid staff for this organization. The programs currently available include the following:

- One allotment Community/School Garden is operating in Greater Vernon.
- A Community Garden Network Development Plan is underway.
- Community gardens in Armstrong and Lumby garden are in the planning stages.
- The Good Food Box program serves an average of 350 people monthly in all North Okanagan communities.
- Community Kitchens programs are offered in Vernon, Lumby, Armstrong and Enderby and one is pending in Cherryville.
- There is no formal Gleaning program at this time.

The following initiatives are recommended for improving food literacy in the region:

- Complete an assessment of unused or underutilized spaces or facilities in terms of their use for food programs, composting, gardening, etc.
- Create and implement educational programs on organic food production and food preservation.
- Provide neighbourhood schools with more school/community gardening opportunities.
- Determine the current state of, and ways to enhance, the integration of food system information into school curriculum.
- Improve food literacy in media communications.
- Establish a 'library' of food literacy resources, possibly web-based.

Consumer engagement in the regional food system is about building relationships between consumers and producers, increasing awareness of each other's issues, and providing consumers with the tools and resources they need to easily access local food.

Some of the initiatives currently in place in the North Okanagan related to consumer engagement in the food system include:

- Two Farmer's Markets in Vernon, one in Armstrong, one in Enderby and one in Lumby.
- Many farms in the region that provide U-pick opportunities and farm-gate sales.
- The North Okanagan Organic Association website, which provides a membership list.
- Agri-tourism destinations and a seasonal food guide have been published in local tourism/map books.

- The Food Action Society of the North Okanagan plans to feature educational and celebratory events that help to increase the public's understanding of food issues (e.g., showing of the documentary *Tableland*) and highlight locally produced food.
- Initiatives involving students of School District #22 include:
    - Silver Star elementary is involved in the Greater Vernon Community Garden.
    - A *Farm to School Salad Bar* provincial initiative has begun at Vernon Secondary School as a pilot project. Salads featuring available locally produced foods are provided at an affordable price twice per week.
    - School District #22 is working on a revision of their Healthy Living Policy to include the new provincial guidelines for the sale of foods and beverages as well as to improve student connections to the local food system and food security awareness.
    - Clarence Fulton Secondary is developing a cafeteria garden, greenhouse, and plans to involve the neighborhood in this initiative.
    - Many local schools have become participants in the *B.C. Fruit and Vegetable Nutritional Snack Program*, which delivers BC grown fruits and vegetables directly to the school and provides resources to teach students about nutrition and locally grown produce while increasing their consumption of fruits and vegetables.
- The University of British Columbia Okanagan has recently added two courses related to Food Systems.
- The Sustainable Environment Network Society has hosted public forums on the importance of a more sustainable food system.
- There is an annual "Seedy Saturday" event in Enderby.
- *Food Skills for Families* is a new resource created by the BC Healthy Living Alliance and the Canadian Diabetes Association.

Recommendations for ways in which consumer engagement in the regional food system can be enhanced include the following:

- Target producers, suppliers and consumers to determine the reasons behind the lack of retail and restaurant opportunities to access local food.
- Work with local food outlets to help them market their use of regionally produced foods.
- Use downtown festivals, winter carnivals, pageants, seasonal celebrations to generate demand and exposure for local producers and value–added products.
- Organize regional food celebrations that bring community and visitors together to enjoy and learn about our regional food assets.
- Publish a comprehensive "farm-fresh" guide to help consumers, visitors, chefs, etc. to source regional foods.
- Determine the feasibility of moving the UBC Faculty of Land and Food Systems from the Vancouver campus to the Kelowna campus, or creating an additional faculty at UBC-O.

Resiliency

A resilient food system is one which can undergo change without altering its functionality. Resilience in the food system includes a capacity for self-organisation and the capacity to learn and adapt. In a very real sense, resilience can be understood as the opposite of vulnerability. Rather than an approach to agriculture that focuses solely on increasing productive capacity, resilience thinking focuses on reducing risk by increasing the adaptive capacity of people and the ecosystems on which they depend.

Efforts to improve productivity and reduce vulnerability are only effective when they build on local knowledge, protect (or improve) soil and water resources, and sustain or even enhance diversity (of genetic resources and in approaches/farming techniques). Resilience is also about building trust and mutual reliance – people are better able to adapt to challenges when they have strong social networks and are able to include others in decision-making. These relationships are enhanced when the distance between farmers and markets is reduced, where learning engages local people with their neighbors, and where markets are encouraged at the local level.

Many factors affect the resilience of the North Okanagan food system. The key components of resiliency included in this report are the managing of land and water resources so as to maintain or improve food self-reliance, the ability to adapt to climate change, and the incorporation of emergency preparedness on a regional basis. By working to increase the resilience of the food system today, we can mitigate any future deleterious effects.

Food self reliance is commonly considered to be the portion of food consumed in an area that is produced in that area and, as the population grows, the resources needed to maintain or expand the portion of food produced in that area.

The RDNO is completely self reliant for apples, chickens and milk production (but not for milk processing). The region is also self reliant for forage crops used for livestock production. The local grain industry is the most completely self reliant, diversified and integrated sector of local agriculture. It is well integrated within the region with flour milling, secondary food processing, and feed processing for the livestock industry.

The region has a mix of suitable land and the climatic conditions necessary to expand the production of fruit, vegetables and grains for human consumption and grains, forage crops and pasture for livestock operations. However, we are limited by winter temperatures and day length, which do not allow for year round fruit and vegetable production. Currently in this region, the costs of heating and lighting a commercial greenhouse production after October 30 would exceed any revenue generated by the operation.

Climate change is considered by many scientists to be the most serious issue facing the world today. Climate change could significantly impact agricultural production through a number of mechanisms including the following:

- The loss of soil organic matter due to soil warming.
- Generally more abundant insect pests as temperatures increase. Migrant pests are expected to respond more quickly to climate change than plants, and may be able to colonize newly available crops/habitats.
- Losses from plant diseases, losses in the efficacy of disease management strategies and in the geographical distribution of plant diseases. Climate change could have positive, negative or no

impact on individual plant diseases, but with increased temperatures and humidity many pathogens are predicted to increase in severity.

There is still a substantial amount of uncertainty around what the impacts of climate change will mean for our regional food system. Decision-makers would benefit significantly from more detailed climate data, including the following:

- Additional weather stations to improve the accuracy of decision making tools at both an operational and strategic level, particularly decision-making associated with irrigation scheduling and quantities.
- More accurate climate change modeling of temperature and precipitation variables for the North Okanagan to inform decision making associated with food production.
- An increased focus on research and model development associated with the impacts of extreme climate and weather events on food system infrastructure and regional food producers.
- An improved understanding of potential changes in wind regimes, and the intensity and distribution of invasive plants and animals, insects and diseases.
- An improved understanding of the impact of climate change on competing agricultural regions, and the impact of climate change on potential and existing external markets of North Okanagan producers and processors.

There are several initiatives underway in the Okanagan that will help our region to adapt to climate change and also help to mitigate the impacts of our food system on greenhouse gas emissions. These include:

- The *Okanagan Basin Water Supply and Demand Project* **(**expected completion 2009**)**.
- The University of British Columbia – Okanagan and the Pacific AgriFood Research Centre are both actively involved in research partnerships associated with climate change adaptation in the Okanagan.
- The British Columbia Agriculture Plan is a long term strategic vision for the agricultural industry in British Columbia. A key component of the plan is providing strategic direction for the agricultural and food sector to mitigate climate change impacts.
- A manure anaerobic digestion facility is currently under development at a large dairy farm near Enderby.

In addition to the need to fill the data gaps that have been described above, it is recommended that a study be conducted to investigate the potential for creating and implementing a reward system for agricultural practices that increase carbon sequestration.

Emergency preparedness is important for protecting lives, reducing suffering, protecting property, mitigating damage to the environment, and for controlling economic consequences in the case of emergencies and disasters.

In the wintertime, most of the regional food supplies come from elsewhere, with an average household food supply of 2-3 days, with an additional 3-4 days of food supply in the retail grocery system. The strengthening of a regional food system plays an integral part in emergency preparedness by reducing the reliance on outside food sources.

The City of Vernon has partnered with the District of Coldstream to implement an Emergency Response and Recovery Plan for the Vernon/Coldstream boundaries. One component of the plan is to encourage each household to maintain a supply of food and water sufficient for 72 hours and the means to prepare meals, if the power is out. Households that are food secure with adequate supplies and storage facilities will reduce the burden of emergency services.

To improve our ability to respond to emergencies, as related to the food system, it is recommended that the region:

- Develop local food procurement policies for emergency preparedness plans.
- Encourage the provision of food storage space in new housing construction.
- Encourage 72 hour household preparedness in all jurisdictions.
- Provide workshops on seed saving.

Next Steps

Upon completion of this report, one or more public forums will be held in the region. This will allow the presentation of the report to all that are interested in engaging in the process of strengthening our food system (i.e., citizens, community groups, government, the business community, and the agricultural sector). Following the presentation of the report, those attending the forum(s) will be asked to assist in the creation of an Action Plan. We will need to identify our current capacity in the region, potential partnerships, and priority actions (with timelines attached). The recommendations in this report will form the basis for the discussions on priority actions. In addition, this report will provide background information to the working groups that will be contributing to the Regional Growth Strategy.

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1. Introduction

The purpose of this report is to provide a summary of what we currently know about the North Okanagan Food System and to provide recommendations for a plan of action and an implementation framework for collaborative community planning that will move us towards a stronger, more resilient regional food system. The information contained in the report will also be used to inform the working groups that will contribute to the creation of a Regional Growth Strategy for the North Okanagan.

The information included in this report has been gathered from Statistics Canada census data, regional data, stakeholder interviews, food security assessment consultations and input from the Regional Food System Plan Steering Committee and the North Okanagan Food Action Coalition.

1.1 Background to this Report

In February of 2006, The North Okanagan Food Security Coalition conducted a food forum for the general public and received input on the key food issues for the North Okanagan. Five key issues were brought forward at the forum, including the need for support for local farmers, food distribution issues, the relationship between the cost of food and health, trade issues, and the need for emergency food program coordination. This meeting also highlighted the need for a full community food security assessment and recommendations for next steps to increase food security in the North Okanagan.

To this end, the Coalition applied for government funding in June 2006 from the Interior Health Authority to investigate the accessibility of healthy food to residents of the North Okanagan. Having successfully secured funding, the *Food Security Assessment and Action Plan* (Nyberg-Smith 2007) was completed. Details of the findings of the assessment will be discussed in Section 2.2.1.

The opportunity to develop a Regional Food System Plan, a priority identified in the *Food Security Assessment and Action Plan*, came in late 2007 with funding from the Union of BC Municipalities. Significantly, the opportunity to provide strategic direction on strengthening the regional food system coincided with the identification of 'Agriculture and Food System Planning' as a key growth issue to be considered in the Regional District of the North Okanagan (RDNO) Regional Growth Strategy, a process initiated in 2008.

1.2 What is a Regional Food System?

It is now generally accepted that the term "food system" refers to the interconnected activities that provide us with food. This includes production, processing, packaging, transporting, marketing, consuming and disposal of waste. The food system operates within and is influenced by social, political, economic and natural environments. Each aspect of the system is also dependent on human resources that provide labor, research and education.

The concept of a regional food system is sometimes used interchangeably with the terms "local" or "community" food systems. In all of these, there is an emphasis on strengthening existing (or developing new) relationships between all components of the food system. This reflects an approach to building a food system that holds sustainability - economic, environmental and social - as a long-term goal toward which a community strives. A healthy, sustainable food system and community food security is achieved when policies, programs and services are integrated, partnerships are strong, and it is recognized that the responsibility for food security resides with individuals, communities and all levels of government (see Figure 1).

A community food system can refer to a relatively small area, such as a neighbourhood, or progressively larger areas - towns, cities, or regions. For the purposes of this report, the geographical context for the Regional Food System includes all of the communities of the North Okanagan Regional District (see section 1.5).

A regional food system may be distinguished from the 'global' food system by the emphasis it places on four concepts – food security, proximity, self-reliance, and sustainability. A key goal of a strong regional food system is to create community food security, which addresses healthy food access within a community context. The distance between the various components of the food system, or the 'proximity', is generally shortened in a regional food system when compared to the global food system. Though the aim of a regional food system is not total self-sufficiency, an important focus of regional food systems is the optimization of the extent to which the community meets its own food needs (i.e., its self-reliance). Fourthly, regional food systems place an emphasis on ensuring that agricultural and food system practices do not compromise the ability of future generations to meet their food needs (i.e., the system is sustainable). The food system comes closer to a sustainable state when diverse agriculture exists near thriving markets, non-renewable inputs are reduced, and community participation in food system decision-making is enhanced (http://foodsys.cce.cornell.edu/primer.html).

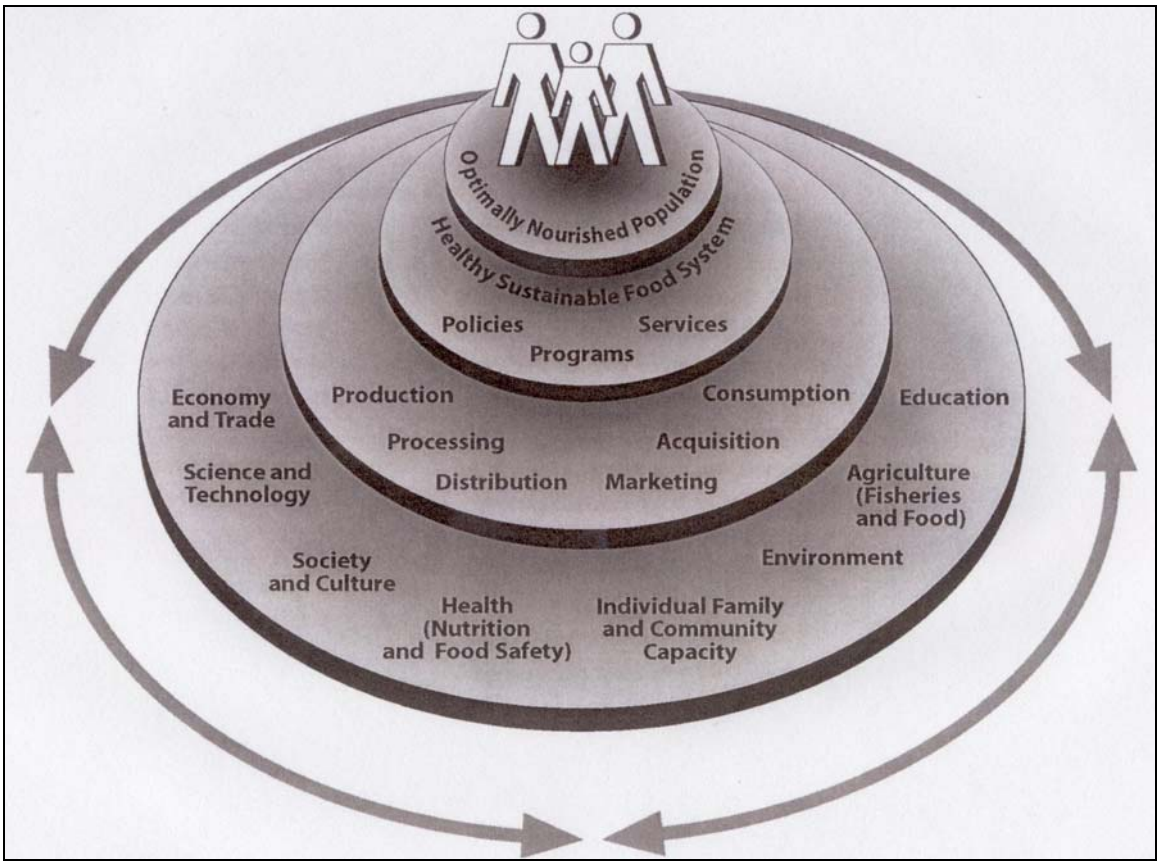


Figure 1. A Healthy, Sustainable Food System Framework

Adapted from *Making the Connection-Food Security and Public Health* 2004

1.3 Why Is a Regional Food System Important?

Redesigning and strengthening the regional food system, with a focus on both economic and social links, is seen as a proactive way to address concerns around food safety and accessibility and the health issues related to diet and nutrition. At the same time, a strong regional food system will support local farmers and rural economies, maintain rural landscapes, improve access to local, fresh food, protect the environment, and contribute to a sense of pride in the uniqueness of the North Okanagan Region.

Recognition of the importance of food system planning is growing throughout the world as planners, researchers, policy makers and activists recognise the changes in global population growth and the requirement for food supplies. Linked to these concerns are those of food production, distribution and safety in the face of increasing climatic disruptions.

The provincial government of B.C. demonstrated its conviction that food system planning is important when the Ministry of Community Development launched *A Guide to Green Choices* in 2008. This guide is designed to provide local government with practical advice and ideas in making land use decisions. It recognizes a strong local food supply as one of seven major issues that B.C. local governments face, and emphasizes the following:

> "green communities need a strong local food supply for several reasons - not only does locally-grown food make a fresh and attractive contribution to the unique character of communities, it also

has a significantly lower carbon footprint than items transported from thousands of miles away. Local food capacity is also important from a community resilience perspective. As climate change begins to manifest itself in different parts of the globe, having access to local food minimizes our dependence on sources outside the community, and it reduces our vulnerability to crisis in the event that supply is affected. Finally, agricultural land can play an important ecosystem role by providing habitat and wildlife corridors.

Yet, regardless of the value of local food capacity, and the farming activities that furnish it, there are increasing threats to our agricultural resource base. These come most immediately from pressures to convert agricultural lands to other uses. These pressures are worrying since B.C. is home to eight percent of Canada's population, but contains only one percent of the country's potential agricultural land. But they also come from within the farm industry itself, particularly as a large cohort of farmers reaches retirement age. They can also occur from adjacent land uses creating conflicts with basic farm activities. Agricultural viability is thus an important consideration — and local governments have a role to play in this regard".

The importance of food systems has been recognized in other provinces of Canada as well. In May of 2006, a *Manitoba Food Charter* draft was launched in Winnipeg. The charter is both a document and an organization. It is a one page statement about what the people of Manitoba think their food system should look like. It was created from input gathered from over 70 community consultations with stakeholder groups and concerned citizens (http://food.cimnet.ca/cim/43C1_3T7T4T97.dhtm).

In 1991, Toronto created the Toronto Food Policy Council, which partners with business and community groups to develop policies and programs promoting food security. The goal of the Food Policy Council is to create a "food system that fosters equitable food access, nutrition, community development and environmental health". Over the past decade, the Toronto Food Policy Council has produced 15 discussion papers on various elements of a food systems approach to public health policy (http://www.toronto.ca/health/tfpc_discussion_paper.htm). Closer to home, Vancouver, Kamloops and Kelowna have also created Food Policy Councils.

1.4 Purpose of this Report

The overall goal of food system planning is to help the region move towards increasing food security and food self-reliance by building a more sustainable, economically viable and resilient regional food system. The way to achieving this will not be easy to define. The regional food system is complex and its components are strongly linked and interdependent. The system is also dynamic, influenced by such things as changing economic issues, environmental needs or constraints, climatic impacts, energy costs, population growth, development pressures, and community priorities.

This plan represents the first step towards meeting the overall goal. As such, this plan is intended to achieve the following:

1. Identify the important strengths and opportunities in our food system as well as the gaps, needs and barriers to a sustainable regional food system, since a shared understanding of the issues is critical to establishing future strategic direction.
2. Ensure that the plan considers the impact of climate change and issues around energy use and reduction of greenhouse gas emissions.

3. Make recommendations for further study, action, policy development and community engagement.
4. Identify potential partners to be involved in the implementation of the plan (thus enhancing chances for collaboration, capacity building and networking).
5. Ensure that the plan informs the Regional Growth Strategy process.

Given the complexities of our regional food system, the significant number of issues to be addressed, and the numerous possibilities for next steps, it must be emphasized that this document is meant to represent only a beginning foundation from which citizens, community groups, government, the business community, and the agricultural sector can continue the work of strengthening our regional food system and increasing its resiliency.

It must also be emphasized that there are a significant number of food system related initiatives completed or in progress in the region. It was not the intention of this report to provide an exhaustive list of all that is occurring in the region but only to provide examples of some of the work that has been completed or is in progress.

Upon completion of this report, a public forum will be held to present the report and use it to create an Action Plan. This process will identify priority actions from the recommendations in this report and determine timelines and potential partners in the implementation of the Action Plan.

In addition, this report will be used as a reference document for consideration within the Regional Growth Strategy policy development process. Agriculture and food systems are considered one of the eight (8) primary growth issues under investigation and, as a result, this document will inform the relevant technical growth issues groups. In particular, this document will be used as the primary reference for the Agriculture and Food Systems Working Group, and will inform other working groups exploring issues related to economic development, water stewardship, social concerns, transportation, and natural lands.

Profile of the North Okanagan Region

Incorporated in 1965, the Regional District of the North Okanagan has a population of 77,301 (est. 2006) and an area of 787,190 hectares. It comprises of 11 political jurisdictions, comprised of 6 municipalities and 5 electoral areas, including the following:

- City of Armstrong
- District of Coldstream
- City of Enderby
- Village of Lumby
- Township of Spallumcheen
- City of Vernon
- Electoral Areas:
  - "B" – West Side / Commonage Area
  - "C" – Centre Area / Silver Star / BX Area
  - "D" – South Western Area / Trinity Valley / Creighton Valley
  - "E" – Eastern Area / Cherryville / Creighton Valley
  - "F" – Northern Area / Grindrod / Grandview Bench / Ashton Creek / Kingfisher / south end of Mara

Statistics Canada, when reporting on agricultural census data, has subdivided the North Okanagan into the following five different regions:

- Spallumcheen, which includes lands around the City of Armstrong and the Township of Spallumcheen
- North Okanagan B, which contains lands around City of Vernon, District of Coldstream, Lavington and Electoral Areas "C" and "D"
- North Okanagan D, which contains lands around Lumby, Creighton Valley, Mabel Lake, Trinity Valley
- North Okanagan E, which contains lands around Cherryville
- North Okanagan F, which contains lands around Enderby, Grindrod, Ashton Creek, Mara

Ministry of Community Development statistics (BC Stats 2006) (http://www.bcstats.gov.bc.ca/data/dd/facsheet/CF240.pdf) show that close to 50% of the population of the region is over the age of 45 years.

The main economic drivers of the region are agriculture, forestry and tourism. In 2006, the majority of employment opportunities came from the following industries:

- Retail trade (12.7% of labour force)
- Health care and assistance (11.3% of labour force)
- Manufacturing (11.1% of labour force)
- Construction (10.3% of labour force)

Farms accounted for 4.6% of the labour force, while support activities for farms accounted for 0.3% of the labour force.

Close to 70% of the ALR in the North Okanagan is located within Electoral Areas "D" and "F" and the Township of Spallumcheen. ALR lands within the City of Vernon account for approximately 18% of the land area within that city's boundaries (see Table 1).

Table 1. Distribution of ALR lands within the RDNO

RDNO Jurisdiction	**Area of ALR (hectares)**	**RDNO Jurisdiction**	**Area of ALR (hectares)**
Electoral Area "D"	17,324	City of Vernon	2,414
Electoral Area "F"	14,163	Electoral Area "C"	1,671
Township of Spallumcheen	14,103	City of Armstrong	156
Electoral Area "B"	8,590	City of Enderby	65
Electoral Area "E"	7,486	District of Lumby	45
District of Coldstream	3,685		

2. Strengthening our Food System

Building a sustainable regional food system requires a comprehensive (whole community) approach to meeting the food needs of people living in the North Okanagan. A sustainable North Okanagan food system is envisioned as integrating economic, social and environmental needs, while being resilient in the face of change.

To begin the process of strengthening the food system, it is helpful to examine its various components and to identify the existing assets as well as the gaps, needs and barriers to a sustainable regional food system. This will establish a shared understanding of the issues and help us to create dynamic relationships and partnerships, which are important if we are to move forward strategically.

The food system is a complex, interconnected assembly of activities, which are each influenced by the individual and collective actions of our citizens, by government policy and planning initiatives, economic forces and our natural environment.

Given the complexity of this system and the substantial number of issues related to it, this report focuses only on some of the key issues for the region. These have been organized into three different sub-sections –the agricultural sector, health and the consumer, and resiliency. Each sub-section will provide an overview of our regional assets and/or initiatives in place (or pending), and an overview of the challenges to be overcome in the process of building a stronger, more resilient food system. Successful models, tools or initiatives from other jurisdictions have been included wherever possible (see **Case Study** sections).

In addition, each sub-section will, wherever possible, provide recommendations for initiatives that could lead the region towards building a stronger and more resilient food system. The public consultation that will follow the completion of this plan will be used to both prioritize and to add to the recommendations provided here.

Our Fragile Food System

- Large-scale food manufacturers can affect a great number of consumers through the potential spread of food-borne disease. *Canadian Nurses Association*
- Canada imports about half of what Canadian eat, and exports about half the food it produces. *Statistics Canada*
- The numbers of farms and farmers in Canada continues to decline with a loss of 20,000 operators between 2001 and 2006. *Statistics Canada*
- In 2004, Canada's farmers had an average net farm income of -$10,000. In 2003, the number was -$16,000. *Statistics Canada*
- More than 76,500 British Columbians, including 28,000 children, used food banks in 2007 *Dieticians of Canada 2007*
- Two-thirds of fruits and vegetables consumed in Canada are imported from 150 countries. *Agriculture and Agri-Food Canada*

The Agricultural Sector

Though less than 5% of the land base in B.C. is arable (and 1% is considered prime agricultural land), the agricultural sector of the province is extremely productive and diverse. B.C. produces more blueberries, cranberries and raspberries than any other Canadian province. It ranks either second or third in the country for the production of greenhouse tomatoes, dairy products, hens and chickens, ginseng, grapes, apples, sweet cherries, flowers, eggs, sweet peppers and mushrooms (Curran 2005).

Farming in BC

"In BC, communities face many challenges to conserving farmland and developing a local, sustainable food supply:

- Ongoing development pressures threaten farmland;
- Average age of BC farmers is 57 years;
- Knowledge about farming is disappearing;
- Low incomes, hard work, and high risks discourage new farmers;
- Demand for local, organically-grown food is up, and exceeds supply;
- High cost of farmland is a barrier for new farmers."

From: Farm Folk /City Folk (http://www.ffcf.bc.ca/NewSiteFiles/programs/farm/community_farms.html)

This agricultural landscape is an integral part of our identity and contributes to our social, environmental, and economic well-being. It is estimated that B.C. farmers produce 48% of all foods consumed in B.C. and produce 56% of foods consumed that can be economically grown in B.C. (B.C. Ministry of Agriculture and Lands 2006). This contributes significantly to our self-sufficiency, making us less reliant on the stability of resources, climate, transportation infrastructure, and the politics outside of our region.

Agricultural land has an aesthetic value and open, green spaces near urban areas provide scenic landscapes, recreation opportunities, and contribute to our enjoyment of the outdoors.

Diverse farmlands provide environmental benefits. They create a variety of wildlife habitats and wildlife corridors, which support biodiversity. Agricultural land also provides wetland areas (e.g., ditches, streams, creeks, rivers and wetlands) that retain and carry stormwater, and improve water quality.

Agriculture also provides economic benefits – for example, in 2006, total gross farm receipts were estimated to be worth over 100 million dollars and farms provided jobs for 4.6% of the labour force in the North Okanagan region (Statistics Canada 2006).

Despite its critical contributions to our quality of life, the long-term sustainability of our agricultural sector is facing a number of challenges. During the extensive consultations that occurred for the *North Okanagan Food Security Assessment and Action Plan* (Nyberg-Smith 2007), a number of key issues were identified by local members of the agricultural sector as barriers to local food production. These issues provide the basis for the following discussion, which includes issues around land, water, distribution, processing and waste management, economic development, policy and planning, productivity and land stewardship, and urban agriculture.

2.1.1 The Land Base

Within the North Okanagan, the lands with suitable soil and adequate water to support cultivated crops are the valley bottoms within the Okanagan and Shuswap Highlands. Like British Columbia as a whole, only a small area of the region is arable.

The area being farmed in the North Okanagan covers 76,624 hectares, which represents just less than 10% of the total area of the Regional District (B.C. Ministry of Agriculture and Lands 2005; Statistics Canada 2006). Of this, just less than 66,000 hectares is in the Agricultural Land Reserve.

In 1972, the Provincial government created a unique provincial land use regime, the Agricultural Land Reserve (ALR), intended to protect a land base strictly for agricultural purposes. Since then, the ALR has provided an important land base for agricultural production and has, for the most part, prevented the sprawl of urban and suburban communities into farmland. However, intensifying development pressures on agricultural land adjacent to urban areas has led to increasing numbers of applications for exclusion from the land reserve.

The arable land base in the North Okanagan is under extreme threat as market forces substantially increase the value of the land for development. This results in the cost of land being prohibitive for many of those wishing to enter into farming. It has also led to increasing numbers of applications for exclusion from the Agricultural Land Reserve with a cumulative effect of "death by a thousand small cuts to the very land that can produce food locally" (RDNO 2008). Without an agricultural land base, we have little or no productive capacity and are at the mercy of others to provide our community with food.

In 1974, the total area designated to the Agricultural Land Reserve in the North Okanagan was 70,283 hectares. In the period since to March 2008, a total of 1,536 hectares have been added to the Reserve and 5,946 hectares have been excluded. This brings the current total of agricultural land in the reserve in the RDNO to 65,873 hectares or just over 8% of the total land area of the region (Provincial Agricultural Land Commission 2008).

Initiatives that Help Maintain a Viable Land Base

Case Study 1

A community farm is a multi-functional farm where the land is held in trust and farmers can work together on local food production using sustainable practices focused on local food production. There are currently over 20 farms in B.C. that are engaged in this type of farming as part of a *Community Farms Program*, which is a joint venture between FarmFolk/CityFolk Society (FFCF) and The Land Conservancy of British Columbia (*TLC*). This program brings together landowners, farmers, local communities and resources to develop and support alternative farm models in B.C. (http://www.ffcf.bc.ca/NewSiteFiles/programs/farm/community_farms.html).

The *TLC* currently has several projects underway, most located in the coastal region of B.C. One project in the Interior is the Turtle Valley Farm, located about half way between Kamloops and Salmon Arm. *TLC* is in the process of leasing the land to a farming couple for winter vegetable crops and to another farmer who lives on the property. The land is currently used to graze cattle, sheep, emu and for hay production and to produce pigs, ducks and chickens (*TLC* 2008).

Case Study 2

The Farmlands Trust is a non-profit society, founded in early 2008. Its mission is to:

- Enhance the farming capability of the Mount Newton Valley in Saanichton, B.C.
- Provide education and mentorship opportunities for new farmers
- Rehabilitate the Hagan Creek stream ecology
- Provide community access to the valley via a trail system (www.farmlandstrust.ca)

Case Study 3

FarmLINK Ontario is a joint program of the Ontario Farmland Trust, FarmStart, and the Kawartha Heritage Conservancy, which is designed to bring together new farmers who are looking for land with farm owners who are interested in selling or leasing a portion of their land for agricultural use. The Land Conservancy of B.C. has recently partnered with various community organizations in leasing agricultural land entrusted to The Land Conservancy to young farmers (Knudsen 2003).

Recommendations

The following is recommended in order to protect the agricultural land base:

- Explore and support opportunities for community agricultural lands to be developed, using a variety of tools, with leasing opportunities for new farmers (e.g., land trusts).
- Encourage planning of appropriate buffers between agricultural lands and urban developments.
- Encourage jurisdictions to work with the Agricultural Land Commission (ALC) to develop a 'no net loss of agricultural land' policy.
- Encourage jurisdictions to consider non-farm use applications to the ALC only when the proposed use is supportive of the food system.

2.1.2 Production

In the North Okanagan, farmland accounts for approximately 10% of the land base, which supports a diversity of production from pasture for livestock grazing, grains, fruits and vegetables and a variety of livestock production. Organic production in the region includes market gardens, orchards, feed crops, cattle and chicken operations as well as a bison and deer farm (http://www.certifiedorganic.bc.ca/cb/nooa.php).

While statistics showed a slight decrease in the number of farms from 1996 to 2001 (from 1,187 to 1,175) within the RDNO, data from 2006 shows an overall increase in the number of farms, with a total of 1,227 farms reporting. In the period from 1996 to 2001, the average farm size increased from 49.3 hectares to 61.8 hectares (B.C. Ministry of Agriculture and Lands 2005). Data shows that the average size remained at 62 hectares in 2006 (Statistics Canada 2006).

Of real concern to farmers is that many of them are nearing retirement and they see a lack of younger people entering the profession. The average age of farmers in the region is 54.6 years of age (see Table 2). Factors such as the high cost of land and the difficulties in generating income from farming are barriers to those younger who wish to begin farming. In B.C., 50% of farm sales average less than $10,000 annually and many farm operators rely on a second, off-farm income (Smart Growth B.C. website). In 2005,

In 2002, just 11,000 acres of orchards in the Okanagan, Similkameen and Creston Valleys produced $72.3 million for the BC economy – and a billion apples. BC produces 30% of the apples grown in Canada.

We consume only 25% of those. The average British Columbian eats only 75-100 apples/year – far less than the apple a day recommended to keep the doctor away.

That means that BC exports about 75% of the apples we grow. Yet we import a lot, too. Our biggest competitor for our own and international markets is Washington State which, although they have similar climate and growing conditions, produces up to 20 times the amount of apples that BC does.

From: The Farmland Defense League

just over 40% of farmers in the region reported working of average of 20 hours per week or more (about 20% worked more than 40 hrs/wk) on non-farm work (Statistics Canada 2006).

Another serious issue for farmers is the shortage of seasonal field workers. The shortage is especially an issue for those producing labour intensive crops such as berries and vegetables. The traditional pool of seasonal workers is aging; and that, combined with competitive wages and working conditions offered by other employment sectors, has resulted in a shortage of workers in agriculture. The shortage is being alleviated somewhat by the federal government's Seasonal Agricultural Workers' Program (SAWP), which enables horticultural farmers to bring in seasonal workers from Mexico. However, there are monetary, regulatory, and cultural requirements of SAWP which make it unsuitable for some farmers. As part of the long-term labour solution, several projects are underway in schools, post secondary institutions, and community centres to promote the career opportunities in agriculture (B.C. Ministry of Ag and Lands 2007).

As an extension of the labour issue, the need for farm worker housing is another issue impacting producers. There is a hope that local jurisdictions will consider changing their bylaws to accommodate this need. Recently, the B.C. Ministry of Agriculture and Lands prepared a discussion paper that outlines a set of criteria that can be used by local governments to regulate the Temporary Farm Worker Housing (TFWH) in the Agricultural Land Reserve. TFWH has become an issue in B.C. due to the growing demand for temporary migrant farm workers, particularly in the South Coast and Okanagan Valley regions. As part of the program requirements under SAWP, farmers must provide housing for the workers (Sustainable Agriculture Management Branch and Regional Operations Branch 2008).

Table 2. Distribution of farms within the RDNO (Statistics Canada 2006)

	Spallumcheen	**North Okanagan B**	**North Okanagan D**	**North Okanagan E**	**North Okanagan F**
Farm and farm operator statistics					
Total population in 2006	9,206	55,418	4,471	934	7,272
Total number of farms	450	360	152	49	216
Total number of operators	685	515	240	70	335
Average age of operators	54.9	55.6	53.5	54.2	54.8
Crop and horticulture statistics					
Land in crops (hectares)	8,978	3,123	3,944	832	4,012

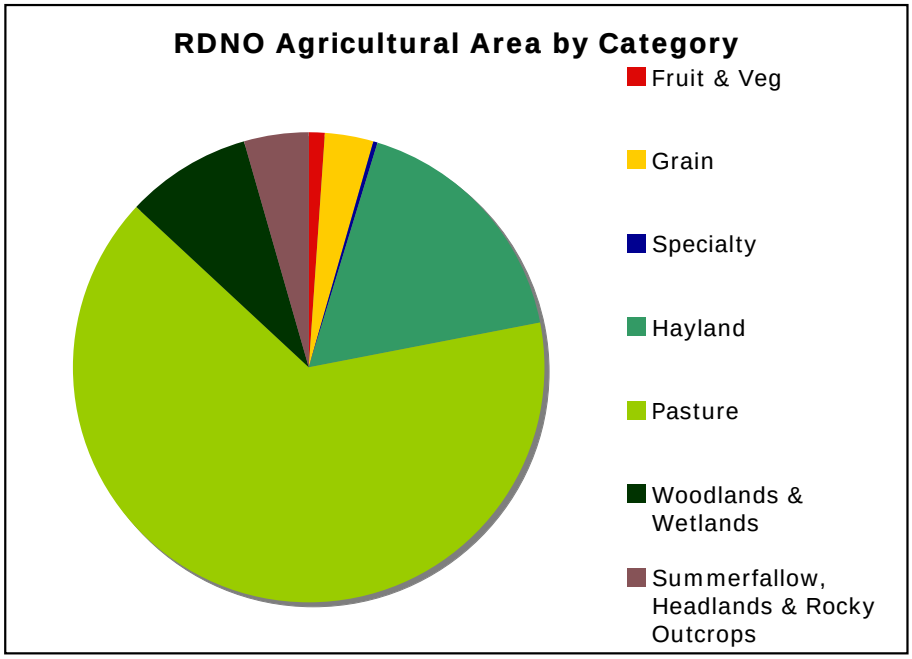
Crops

Pasture for livestock grazing accounts for 65% of the land base, with 17% in hayland. Approximately 3% of the land base is in grain production and just over 1% is in fruit and vegetable production (see Table 3). Specialty crops such as ginseng and other medicinal botanicals account for just over 0.1% of the land base. The remaining portion of ALR land is woodlands, wetlands, summerfallow land (kept bare for weed control), headlands and rocky outcrops (Figure 2).

Table 3. Area (hectares) of land in top five crops of each division of North Okanagan region (Stats Canada 2006)

Spallumcheen		**North Okanagan B**		**North Okanagan D**		**North Okanagan E**		**North Okanagan F**	
Crop	Area (hectares)	Crop	Area (hectares)	Crop	Area (hectares)	Crop	Area (hectares)	Crop	Area (hectares)
Alfalfa and alfalfa mixtures	4,607	Alfalfa and alfalfa mixtures	1,170	Alfalfa and alfalfa mixtures	1,981	All other tame hay and fodder crops	528	Alfalfa and alfalfa mixtures	2,443
All other tame hay and fodder crops	1,207	All other tame hay and fodder crops	829	All other tame hay and fodder crops	1,244	Alfalfa and alfalfa mixtures	258	All other tame hay and fodder crops	619
Barley	1,138	Apples	305	Barley	160	Other vegetables	1	Barley	184
Corn for silage	680	Oats	61	Potatoes	32	x	x	Oats	55
Winter wheat	273	Spring wheat (excluding durum)	34	Total Christmas tree area	4	x	x	Total area of nursery products	23

Figure 2. Distribution of Crops in the RDNO



Livestock

Cattle and hog production are the most predominant types of livestock production in the region (see Table 4). Statistics Canada's data lists 246 chicken farms reporting in the RDNO in 2006, producing over 1 million chickens in total. Anecdotal information suggests that approximately 30 of these producers were quota growers and the remainder were small scale producers (Johnson 2008). Total production of lamb and sheep in 2006 was 5,210 animals from 79 farms (Statistics Canada 2006). Other livestock produced in the region include horses, goats, wild boar, bison, llama and alpacas and deer (see Table 5).

Table 4. Distribution of Predominant Livestock Production in the RDNO (Statistics Canada 2006).

	Spallumcheen	**North Okanagan B**	**North Okanagan D**	**North Okanagan E**	**North Okanagan F**
Livestock statistics					
Total cattle and calves	11,109	9,922	7,813	1,228	9,561
Total pigs	1,783	74	x	x	202

Table 5. Other Livestock produced in RDNO

Livestock	Total RDNO
Horses and ponies	
Farms reporting	444
Number	3,426
Goats	
Farms reporting	56
Number	1,107
Wild Boars	
Farms reporting	3
Number	x
Bison (Buffalo)	
Farms reporting	9
Number	111
Llamas and Alpacas	
Farms reporting	40
Number	449
Deer (excluding wild deer)	
Farms reporting	5
Number	x

Organic Production

In 2005, British Columbia supported a total of 482 certified organic producers, which represented 2.8% of the total farmers in the province and 13% of the total organic farmers in Canada. Production of these farms is valued at $29.1 million (http://www.certifiedorganic.bc.ca/aboutorganic/orgmarket.htm).

In 1989, an organic association was formed in the North Okanagan with the intent to create a certification procedure and to provide information to both organic producers and to consumers. At present, the North Okanagan Organic Association provides certification services to an average of 45 operations every year. Those commodity groups currently certified include market gardens, orchards, feed crops, cattle and chicken operations, as well as a bison and deer farm. Total acres in the certification program amount to approximately 3000 acres (http://www.certifiedorganic.bc.ca/cb/nooa.php).

Organic growers in B.C. face certain challenges that are specific to the organic sector (B.C. Ministry of Ag and Lands 2007), including the following:

- **Local and National Competitive Challenges**

  Competition from the influx of low cost, high quality imported produce is becoming more of a problem as large grocery chains expand their organic stocks. Once imported products become established in retail space, they can be very difficult to displace. Foreign produce imports capture the market during the time of year when domestic supply dwindles and wholesale prices for many fresh organic crops are at their highest. Once the British Columbia production season starts, the supply of fresh produce can be flooded and wholesale prices of some crops can fall rapidly. Competition between local producers can be very strong, especially among producers who depend solely on local markets. Because the supply is relatively small, it is easy to cause big fluctuations in the market. Additionally, some producers are unfamiliar with establishing prices and are unaware of price structure differences for retail, wholesale, or direct marketing. Differences in organic standards across the country can give competitors from other provinces an advantage over the organic sector in British Columbia. Production costs of some commodities can differ from province to province as a result. With the introduction of a revised National Organic Standard and Regulation, this will become less of an issue.

- **Geography**

  Organic farms are distributed throughout the entire province and tend not to be clustered, but spread over wide areas. With the exception of tree fruits, the organic sector lacks much of the infrastructure necessary to ensure efficient and affordable movement of goods, both domestically and internationally.

- **Food Safety**

  The threat of food-borne illnesses has received increased attention in recent years. On-farm food safety programs have been developed and are delivered by conventional commodity groups. As a result of being modeled on conventional production systems, the programs are not always applicable to organic systems and requirements such as confinement protocols for animals may conflict with organic standards. On-farm food safety programs specific to organic horticulture and animal operations may be required.

- **Pest and Disease Control**

  Pest and disease management is a major concern for growers. The lack of research in the area of pest management, and limited organic pesticide registrations, places British Columbia growers at a disadvantage. The small size of the Canadian organic vegetable sector influences registrants' decisions to spend the resources needed for Canadian registrations. There is a need for development of pest control solutions which are appropriate for use in organic agriculture systems (*i.e.* parasite control in livestock, wireworms in potatoes, cabbage root maggot in brassicas, weed management and technology development *etc.*).

- **Research**

  It is a challenge for the industry to secure the funding required to trigger resources from existing funding programs. This makes it difficult to carry out necessary organic agricultural research and sector development projects in British Columbia.

- **Sourcing Stock/Supplies Appropriate for Organics**

  Grain producers in northern British Columbia currently are in the practice of saving seed. Periodically growers are forced to purchase seed in order to maintain quality. Industry has voiced the concern of the increasing challenges in sourcing organic seed that is free from GE organisms.

  Currently, there is no certified organic hatchery for broilers or layers. Producers requiring relatively small numbers of chicks have difficulty obtaining stock from conventional hatcheries. In the future, conventional hatchery practices (a move towards the combination of vaccinations with antibiotics and others) could make their stock inappropriate for organic production.

- **Regional Pest Control Programs**

  In the event of a pest or disease issue that constitutes a threat to human health or trade access for an industry, control solutions could be implemented by the province that have the potential to severely impact the organic sector. An example is a government-mandated pesticide spray which drifts within the boundaries of an organic operation. Contamination with a product which is not certified for use in an organic system has the potential to cause losses to the organic sector in numerous ways, ranging from crop losses to loss of certification and loss of livelihoods, depending on the circumstances.

- **Lack of Industry Infrastructure**

  The organic industry does not enjoy the same availability of resources as their conventional counterparts. Some examples include animal health services, supplies and marketing resources.

Initiatives that Improve Production

Case Study 1

Livestock producers in New Zealand have developed a system of intensive rotational grazing which has been adopted by livestock producers around the world, reducing feed, labour costs and soil losses while appealing to developing markets for grass-fed meat (Beetz 2004).

Case Study 2

Small Plot Intensive horticulture (SPIN) is a food production concept originating in Saskatoon but which has spread throughout Canada, the US, South Africa, Australia and the UK. SPIN focuses on intensive, sequential growing of crops on limited land areas (Siobhan 2008). The Land Conservancy of B.C. has entered into a land lease with a young farmer operating a SPIN operation in the Capital Region of B.C. (King pers. comm.).

Recommendations

It is recommended that the following be implemented so as to improve production in the region:

- Explore ways in which training, resources, assistance and credit for beginning farmers and youth interested in farming and food-related careers can be provided.
- Consider the feasibility of creating a farm labour pool and other ways to address labour issues (including housing).
- Explore strategies to enhance food production resiliency.

2.1.3 Water

As the population in the North Okanagan continues to grow and precipitation measures become increasingly variable as a result of climate change, if we are to ensure a strong and resilient regional food system, it will become imperative that water management policies are designed to secure sufficient water resources for the irrigation of agricultural crops.

The North Okanagan has access to water from both the Fraser River watershed and the Columbia River watershed with irrigation systems to distribute it. The regional government is committed to working on basin-wide water management through the Okanagan Basin Water Board (OBWB). The Okanagan Water Stewardship Council, an advisory committee to the OBWB, has recently completed an Okanagan Sustainable Water Strategy Action Plan (2008) and the *Okanagan Water Supply and Demand Project* is expected to be completed in 2009 (http://www.obwb.ca/water_supply_demand/). Both documents will have a tremendous influence on water management decision-making in the entire watershed.

The Regional District boundaries encompass portions of the drainage of the Shuswap River (which is in the Fraser River watershed) and the Okanagan River (which is in the drainage of the Columbia River). The area of the RDNO within the Okanagan Basin includes the cities of Vernon and Armstrong, the District of Coldstream, and most of Electoral Areas "B" and "C" and most of the Township of Spallumcheen. The remaining areas of the Regional District are found within the Shuswap Basin.

In the valley bottoms where the land is arable, the climate is characterized by hot summers with little precipitation. Dryland farming, where cultivated crops are sustained by retained soil moisture and summer precipitation, occurs in the Spallumcheen, Enderby, Lumby and Mara Lake areas. These areas are primarily in the Shuswap watershed. In the early years of the 20th century, the Spallumcheen Valley was the predominant cereal producing area of the province and it and remains a valuable agricultural area today.

Dryland farming relies on natural precipitation. Much of the agricultural areas of the region can support the dryland farming of some field crops (such as peas and cereals) and forage crops (such as silage corn, hay). Agricultural productivity and the range of agricultural crops, however, are greatly enhanced by the addition of supplemental water through irrigation. In the more arid agricultural areas surrounding Vernon, irrigation is essential for cultivation.

The provision of supplemental water to crops through irrigation has enabled higher production and a greater range of crops to be grown. Of the total of 1,227 farms in the RDNO, just less than half receive irrigation water.

This represents less than 13% of the total land base being farmed in the region (see Table 6). One of the issues raised by area producers is the need for more flexibility with respect to the length of the irrigation season. This is becoming particularly necessary given the expectation of more variable weather conditions resulting from climate change.

Table 6. Irrigated Lands within the RDNO (Statistics Canada 2006)

	Number of Farms with Irrigation	Irrigated Area (Ha.)
Spallumcheen	128	2,346
North Okanagan B	266	3,104
North Okanagan D	70	1,889
North Okanagan E	8	90
North Okanagan F	89	2,249
Total for Regional District	561	9,678

Most of the irrigated land in the region is used for the production of forage for dairy and beef cattle. Figure 3 shows the large extent of irrigated land used for hay and pasture, as well as field crops, such as silage corn. The extensive orchards in the Coldstream and Vernon areas are reflected in the small portion of the graph representing irrigated fruits. The distribution of these categories of irrigated crops across the North Okanagan is shown in Table 7.

Figure 3. Distribution of types of irrigated crops in the RDNO (Statistics Canada 2006)

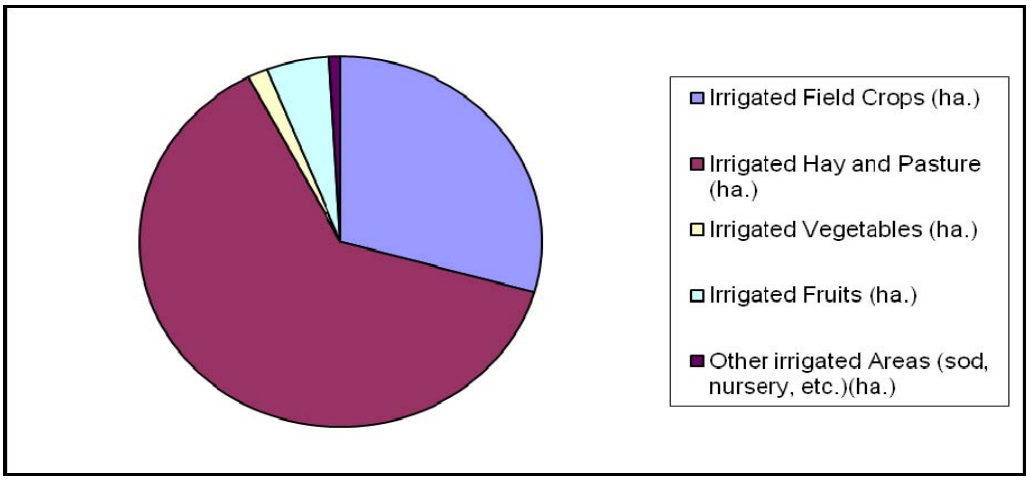


Table 7. Distribution of irrigated crops within the RDNO (Statistics Canada 2006)

	Irrigated Field Crops (Ha.)	Irrigated Hay and Pasture (Ha.)	Irrigated Vegetables (Ha.)	Irrigated Fruits (ha.)	Other (sod, nursery, etc.)(Ha.)
Spallumcheen	1,004	1,186	69	40	46
North Okanagan B	468	2,142	49	433	12
North Okanagan D		1,317			11
North Okanagan E		75			0
North Okanagan F	826	1,380	13	13	17
Total for Regional District	**2,847**	**6,099**	**156**	**490**	**86**

Farmers are able to access water for irrigation purposes in three ways. In most cases, water is provided to farmers by water purveyors (e.g., irrigation districts, local government). In this case, the water purveyor holds licences from the provincial government for the diversion of surface water as well as for dams and storage reservoirs. The largest water purveyor in the North Okanagan is governed by the Greater Vernon Advisory Committee, a Committee of the RDNO that is comprised of elected officials from the City of Vernon, the District of Coldstream and Electoral Areas 'B' and 'C', as well as a representative from the agricultural community, who is appointed by the Regional District Board. This water utility provides services to agricultural, residential, industrial and commercial users within Vernon and Coldstream as well as in portions of Electoral Areas 'B' and 'C'. Water sources for the Greater Vernon system include surface water from Kalamalka Lake and Duteau Creek, and groundwater from Antwerp Spring. The Duteau Creek source includes significant storage reservoirs and infrastructure in the watershed as well as an inter-basin transfer from the Shuswap watershed.

There are 17 small private and public water utilities in Spallumcheen and 6 small utilities in the Armstrong area (Roger Parsonage, pers. comm. 2008). These water districts often use groundwater as their water source.

It is important to note that, in most cases, the water purveyors were originally established to provide agricultural infrastructure to support the developing agricultural economy in the early 20th century. However, as the population has grown and the economy diversified, the utilities have developed infrastructure to supply water for residential, commercial and industrial uses. Most of the customers of the utilities use water for non-agricultural purposes, though the greatest volume of water is used for irrigation. In many cases, the management of these systems has not been able to keep pace with the demands to maintain drinking water quality standards and this has created tension in the system. Agricultural irrigation is required at a reasonable cost and there is a desire to limit what agricultural users pay for their water. On the other hand, the water is also being used for domestic purposes. The fee structure needs to support both the ongoing operation and maintenance of the system, as well as infrastructure upgrades (in some cases significant) required to meet drinking water standards. This is especially an issue for the systems that are not operated by local governments and are therefore not able to access grant funding.

The second way a farmer can obtain irrigation water is to hold a water license directly from the provincial government on a nearby stream that allows for the storage and/or diversion of water for irrigation purposes**.**

The Ministry of Environment (MoE) administers hundreds of water licenses in the region pursuant to the *Water Act.* Many water licences in rural areas are for irrigation purposes. The following are key messages regarding water licences used for irrigation purposes:

- Water licenses are required for use of surface water only.
- Water licenses are given for a specified use such as agricultural purposes
- Water licenses are "appurtenant" or attached to the land. When a parcel is sold, the water licence remains with the property.
- Water licences stipulate the stream(s) from which water can be diverted. A precedence date on the license, or priority date, establishes the seniority rights of licensees on the same stream. Should rationing be required in response to reduced supply, the licensee with the oldest precedence date has first rights to water on that source. Many of the water licences with early precedence dates are for agricultural use reflecting the agricultural pioneer settlement in the region in the late 19th and early 20th centuries.
- Water licenses stipulate the maximum quantity of water that can be used or stored. Many new water licences for irrigation purposes have a maximum withdrawal rate specified in cubic feet per second.
- Water licences stipulate the period for which water may be used. If the water is not used by the licensee for three consecutive years, the licence can be cancelled (although this seldom occurs).
- Water licence provisions are enforced if problems occur downstream from the licensee's diversion/intake. These problems could include impacts on aquatic ecosystems or other licensed water users. The *Water Act* can require water metering and the provision of data to the Ministry of Environment by the licensee in these circumstances.

Finally, a farmer may obtain water by drilling a well and pumping ground water from an aquifer. The use of groundwater for irrigation or any other purpose is not regulated under the *Water Act.* British Columbia is one of the few jurisdictions in North America that does not regulate the consumption of ground water. The *Water Act* does provide for the regulation of ground water use however, the provincial government has not yet enacted these provisions.

Groundwater management initiatives of the MoE are associated with gathering information about the location of wells and the groundwater resource. Information on the location of new wells, and the commercial drillers "well log" are required to be provided to MoE. In addition, the ministry has undertaken or partnered on a number of aquifer mapping initiatives and groundwater studies, particularly in the Okanagan Basin in the Armstrong and Spallumcheen areas.

Drought

One definition of a drought is "a prolonged period of abnormally dry weather that depletes water resources for human and environmental needs" (Atmospheric Environment Service Drought Study Group, 1986). Future climate change predictions project that the potential for drought is going to increase in the future. The direct consequences for agricultural producers associated with drought include:

- Low soil moisture availability
- Higher crop stress (reduced yields)
- Increased livestock stress (death)

Indirect consequences from drought can include a host of impacts, including:

- Changes in the availability and predictability of water resources;
- Higher water demands for agriculture– leading to potential conflicts with other sectors
- Increased wildfire risk; and
- Land degradation

After the onset of drought, different user sectors vying for water in the short term may cause conflicts (i.e., municipalities, hydropower, agriculture). Drought can also force land use changes and even migration out of rural areas, after a prolonged event (C-CIARN 2007).

Examples of the ways in which agricultural operations have adapted to drought in the past include the following:

- Increasing irrigation (but in times of extremely low water, or no water, this is not a viable option because irrigation needs may often exceed supply)
- Using more efficient irrigation, such as scheduling irrigation according to soil moisture
- Planting native grasses for fodder
- Planting drought resistant crops
- Implementing conservation tillage to guard soil moisture
- Diversification of farm systems

It is important that the agricultural sector develop tools to cope with drought and embrace sustainable practices that will reduce its vulnerability to climate change and increase the resilience of the system (e.g., Environmental Farm Planning (see section 2.1.9) and the implementation of Best Management Practices).

The Canadian Climate Impacts and Adaptation Research Network began working on a national drought strategy for Canada's agriculture sector in 2007. Current status of the strategy is unknown at this time.

North Okanagan Initiatives

The Okanagan Basin Water Board (OBWB), of which the RDNO is a part, represents an evolving and unique model for water governance in the province. The OBWB provides leadership to local government in the coordination of basin-scale water management and helps the region to prepare for population growth, development and climate change impacts on water supplies. The OBWB has representatives from the three Okanagan regional districts, the Okanagan Nation Alliance, the Water Supply Association of B.C. and the Okanagan Water Stewardship Council – a broadly-representative stakeholder group established by the Board to provide independent science-based advice on water issues.

The *Okanagan Basin Water Supply and Demand Project* will provide a best estimate of present and future water need and availability, taking into account population growth, climate change, land use change, preservation of the environment, and other factors within the Canadian portion of the Okanagan basin.

This study is being conducted as a partnership between the Okanagan Basin Water Board and the B.C. Ministry of Environment, with significant contributions from the B.C. Ministry of Agriculture, the B.C. Ministry of

Community Services, Environment Canada, Agriculture Canada, Fisheries and Oceans Canada, and the Okanagan Nation. The project is expected to be completed in 2009. The Okanagan Basin Water Supply and Demand Study also includes a Groundwater Assessment of the Okanagan Basin.

As part of the Supply and Demand project, the Ministry of Agriculture, in partnership with Agriculture Canada, is creating an Irrigation Demand Model. It examines current and future irrigation demand of all agricultural parcels in the Okanagan Basin. The report is expected to be available by early 2009.

The City of Vernon's Spray Irrigation Program is widely recognized as an innovative use of reclaimed water. From late April to early October, all reclaimed water, following tertiary treatment, is chlorinated and used as irrigation water on approximately 970 hectares of land in the Commonage area south of Vernon. Areas irrigated with reclaimed water include Predator Ridge Golf Resort, Vernon Golf & Country Club, Vernon Seed Orchard, Kalamalka Forestry Centre and Pacific Regeneration's Vernon Nursery, as well as large areas of agricultural land used for grazing and hay production.

The Greater Vernon Water utility implemented mandatory metering for all residents as of March 2005. The utility is in the process of metering all agricultural users.

The Greater Vernon Water utility has completed a Drought Management Plan. It is a main component for our water restrictions bylaw and a tool for supply and demand-side management. The objectives of the Drought Management Plan are to provide a means of proactively responding to periods of hydrologic drought.

Other Initiatives Related to Water

Case Study 1

The South East Kelowna Irrigation District (SEKID) has undertaken an innovative Agricultural Metering Program (http://www.sekid.ca/agri_metering_program.html). This program uses metering, creative pricing policies, and technological innovations to manage the quantity and timing of irrigation by orchardists. Significant efficiencies to water use have been realized.

Case Study 2

The Trepanier Landscape Unit Water Management Plan was developed through a partnership of the Ministry of Sustainable Resource Management (now the Integrated Land Management Bureau) and the Central Okanagan Regional District in 2004. This strategic plan contains detailed hydrological analysis and twelve recommendations concerning water management in light of the impacts anticipated from climate change and urban growth. The plan provides strategic direction to subsequent Official Community Plan development within the Central Okanagan Regional District.

Case Study 3

The Summerland Water Use Plan was approved in 2005. The plan was created in response to the drought event of 2003 when Fisheries and Oceans Canada ordered increased flows from upland reservoirs to meet fish requirements. Both the agricultural and non-agricultural community in Summerland were impacted. The Summerland Water Use Plan has developed a decision-making framework to best balance the needs of fisheries, agriculture and the community when future droughts occur (http://www.waterbucket.ca/aw/index.asp?type=single&sid=65&id=89)

Case Study 4

FarmWest Climate Station Network provides localized, "real time" climate data to farmers and irrigators. This information supports decision making on the timing and quantity of irrigation, as well as other crop management issues. The closer the proximity of the weather station to the farm, the more accurate the information and more accurate the decision making (http://www.farmwest.com/index.cfm?method=pages.showPage&pageid=48).

Recommendations

Recommendations related to ensuring adequate water supplies are available for agricultural production include the following:

- Support initiatives that increase irrigation efficiencies.

Two recommendations for action were put forward in the Okanagan Basin Sustainable Water Strategy (2008), including:

- **Establish an Agricultural Water Reserve that links agriculture water budget allocations to ALR and agricultural-zoned lands**. It is recommended that this involve the agricultural community, Ministry of Agriculture and Lands, Ministry of Environment, and water purveyors with the OBWB providing support on collaboration, communication strategies and education and information workshops.

- **Extend the date on irrigation licences to allow for irrigation later in the season (October) without increasing the allocation of water**. It is recommended that this involve the Ministry of Environment and water purveyors.

2.1.4 Distribution

Food distribution includes the transportation, storage and marketing of food products to consumers. A significant amount of food is imported into most B.C. communities. It is estimated that the average food import in Canada travels approximately 4,500 km before being consumed (Provincial Health Services Authority 2008). A study by Foodshare, a non-profit located in Toronto, compared the distance dinner ingredients purchased at a grocery store travelled versus the distance the same ingredients travelled when purchased at a farmers' market. This study concluded that the local food items traveled an average of 101 km versus 5,364 km for the imported items (Bentley, 2005).

The distance that our food travels, or 'food miles' as they are now commonly being called, has many implications with respect to our region's dependency on energy, our ability to access fresh foods, and our increasing reliance on food packaging and processing. It also affects our development patterns, local economy and regional identity (Unger and Wooten 2006). Though we often speak of our country's 'cheap food' policy, these food miles (and the current dominating food system) represent many hidden, economic, social and environmental costs that fail to be factored into the actual price of food. In addition to the concept of 'food miles', it is also important that we consider the total carbon foot print of food production, not just distance traveled.

The currently dominant food system relies heavily on fossil fuels for the production, packaging and distribution of food. This represents a significant contribution to our region's greenhouse gas emissions and negatively impacts our air quality. Impacts on air quality, in turn, have related impacts on the health of our citizens. As we consider the reality of the imminent decline of the world's oil reserves, it is becoming increasingly important that our food is produced in a sustainable manner much closer to home.

The quality, flavour, freshness and nutritional value of food are affected by the distances food travels and by the time it spends in storage (since added preservatives and processing are required to reduce spoilage). In contrast to the dominant food system, a local food system can provide fresh, nutritious food that has traveled fewer kilometers, has reduced packaging, and generally less processing (it is, however, important to consider that substantially more energy may have been used to produce food locally compared to food grown in a different climate). Also, in many cases, the relationship between the producer and the consumer involves far fewer food brokers and warehouses and thus the farmer is able to capture more of the food's retail price as profit. However, inefficiencies in both production and distribution within a local food system may lead to increased costs for the local farmer (Unger and Wooten 2006). Inefficiencies in the North Okanagan region will be discussed further in the sections below.

The three primary options for distributing fresh and processed foods include: sale to large wholesalers/distributors, sale to local, independent retail outlets, and sale direct to consumer. While sale to wholesalers/distributors makes up the lion's share of the food distribution market, the best opportunities for sustainable community food systems appear to be sale to retail outlets and sale direct to consumer.

In 2002 BC fresh & processed field vegetable production was worth $32 million, while our imports were more than 10 times that or $332 million.

The US represents 80% of all fresh field vegetable imports and 85% of processed field vegetable imports to BC, and California alone makes up 72% of that. Global warming and domestic water consumption are causing severe water shortages in California that are expected to significantly affect agriculture.

From: The Farmland Defense League

Producer/processor wholesale marketing cooperatives are a good example of selling to retail outlets (as well as institutions like schools and hospitals). These cooperatives give micro and small growers access to markets that would not otherwise be available to them.

Direct to consumer distribution avenues typically include road side stands, farmer's markets, direct home delivery, community supported agriculture (CSA), and food buying clubs. In addition to the economic benefits, these distribution methods provide social benefits by enhancing community relationships and educating people about the benefits of buying local, sustainably produced foods.

To strengthen our food system in the North Okanagan, we will need to enhance and maintain an efficient food distribution infrastructure within the region and ensure that marketing channels are in place that are appropriate for both the scale and type of production. In order to achieve this, we will need to develop a clear understanding of the distribution and marketing tools that are currently in place and then consider ways in which we can support more direct links between farmers and consumers and make certain that farmers receive a fair price for their product.

Marketing Boards

In the province of B.C., we currently have eight marketing boards and 3 industries that are regulated. Under the *Natural Products Marketing (BC) Act,* marketing boards and commissions are allowed to administer schemes

for the promotion, control and regulation of the production, transportation, packing, storage and marketing of natural products, or the prohibition of the same. The following information is taken directly from the B.C. Farm Industry Review Board's website (http://www.firb.gov.bc.ca/boards_comm.htm).

"Supply managed marketing boards and commissions have the authority to permit or prohibit the production of their commodities within British Columbia. Supply management was established to assure consumers of a stable supply of quality food products while ensuring that producers received their costs of production plus a reasonable return on investment. Under Federal-Provincial Agreements, a national agency estimates the annual demand for a product and allocates the demand among participating provinces based on historical provincial allocations. National agencies control inter-provincial and export trade and in some commodities may operate surplus removal programs.

The provincial supply managed marketing boards and commissions have been vested with the authority to regulate production through establishment of a quota system. In addition, the marketing boards and commissions have been vested with the authority to set prices for intraprovincial sales, to licence producers and processors and to fix levies.

In the other regulated industries, marketing boards and commissions may be granted authority to establish marketing quotas, establish prices, collect levies and licence producers. Only the Vegetable Marketing Commission has been granted all of these powers".

The supply managed boards and commissions in the province include the following:

- B.C. Broiler Hatching Egg Commission
- B.C. Chicken Marketing Board
- B.C. Egg Marketing Board
- B.C. Milk Marketing Board
- B.C. Turkey Marketing Board

There are currently 3 industries that are regulated by Commissions including the following:

- B.C. Cranberry Marketing Commission
- B.C. Hog Marketing Commission
- B.C. Vegetable Marketing Commission

The operations of the boards and commissions are funded entirely by producers through license fees or levies. The boards are composed primarily of elected producers and Chairs appointed by the Lieutenant Governor-In-Council.

Organic Marketing

British Columbia and Quebec are currently the only Canadian provinces with legislated organic certification programs. The British Columbia Certified Organic (COABC) phrase or checkmark (shown at left) is licensed to the COABC by the province of British Columbia. The symbol is widely recognized as indicating that the food has been produced according to strict standards for organic farm production and processing (http://www.certifiedorganic.bc.ca/index.htm).

Supply Management of Certified Organic Products

Although some organic farmers have functioned well under the regulated marketing systems in British Columbia, most notably in the dairy sector, the provincial marketing boards and many organic producers have been at odds for years. Organic farmers have specifically chosen to farm according to principles and standards different from those of conventional farmers, and some organic farmers have viewed inclusion in the regulated marketing system as acceptance of and contribution to the conventional agricultural system. Some organic farmers producing regulated products have operated outside the provincial marketing boards, and costly legal disputes between producers and the marketing boards have occurred.

Appeals to the marketing boards to recognize the unique features of specialty production such as certified organic did not achieve effective regulation of specialty products. As a result, the Farm Industry Review Board (FIRB) began a review of specialty production and marketing of regulated commodities in 2003. FIRB directed the marketing boards to establish specialty classes of quota, to be managed separately from other quota classes. Specialty producers would be required to have a form of third party certification (*i.e.* organic) recognized by the marketing board. FIRB also stipulated that the boards provide annually renewable small lot permit programs authorizing production levels greater than the personal use exemption level and less than the quota incentives provided through the new entrant programs. The boards were also directed to create new New Entrants Programs that would prioritize specialty producers to foster growth in the specialty product markets (taken from B.C. Ministry of Agriculture and Lands 2007).

Distribution in the North Okanagan

The *Food Security Assessment and Action Plan* (Nyberg-Smith 2007) identified 50 local wholesalers, 36 mainstream retail outlets, and 18 alternative retailers in the North Okanagan. The local products included organic and non-organic produce, meat, poultry and eggs, dairy products, flour/cereals, medicinal herbs, ginseng, organic spelt, beer, and wine. However, consumers polled for the assessment all stated that local and/or organic products are difficult to find and relatively expensive.

The region has a number of vibrant, seasonal farmers' markets, on-farm markets and community supported agriculture programs (CSA's). Community Supported Agriculture (CSA) is a form of direct-marketing, whereby individual farms or groups of farms sell "shares" of their products to individuals, and distribute products either to designated drop-off sites or to customers' homes. CSA's allow farmers to spread some of the financial risk of the year's harvest to shareholders, since membership fees guarantee income flows. CSA's also support direct farmer-consumer relationships and allow farmers to earn 100% of the retail value of their products.

In the region, some small retail grocery stores and foodservice operations purchase local product from larger commercial producers when available (Kristensen, pers. comm.). Foodservice distributors are responding to their customers' requests for local product by forging new relationships with local producers (Amer, pers. comm.).

Currently, there are two Farmers' Markets in Vernon, one in Armstrong, one in Enderby and one in Lumby. The City of Vernon has expressed an interest in finding a location for a permanent farmers' market. The Vernon Farmers' Market contributes an estimated $1.2 million annually to the local economy (Nyberg-Smith 2007). There are many farms in the region that provide U-pick opportunities and there are at least 21 farm-gate stands (Nyberg-Smith 2007). The North Okanagan Organic Association has a website, which provides a membership list (http://www.certifiedorganic.bc.ca/index.htm).

There is currently a *Good Food Box* program, a fruit and vegetable cooperative for hundreds of families, available in the region. This is a volunteer, nonprofit, produce-buying cooperative, which is designed to help everyone to include more fresh fruit and vegetables in their meals. The program supports several grassroots projects that promote healthy eating, teach food preparation and cultivation, develop community capacity and create non-market based forms of food distribution. The program buys direct from farmers whenever possible (Good Food Box website). The program has continually struggled to maintain itself and has recently been secured by the Food Action Society, which can help with fundraising and promotion so that the coordinator of the program can continue to build and maintain the program (http://foodaction.ca/).

The tree fruit industry is served by co-operative grading, packing and storage facilities. The co-operative also handles the marketing function for the Okanagan tree fruit crop, including sales of off-grade fruit to various processors.

Currently, the region is lacking coordinated vegetable handling, storage and distribution facilities and individual farmers are responsible for building and maintaining their own packing, handling, storage, and distribution facilities. Local farmers have expressed an interest in a cooperative box program that would be located in a centralized warehouse distribution centre (Aasen, pers. comm. 2008). Another issue identified by local farmers is that late winter storage vegetable prices provide insufficient incentive to repay the capital investment required for storage facilities.

The medium-sized operations in the region are particularly lacking in distribution and marketing channels because they tend to be too large to have the time to do direct market sales yet are too small to consistently supply a retail grocery.

Further inefficiencies in our regional food system result from a lack of processing capacity and options as well as a lack of waste management facilities. These issues will be discussed in further detail later in this report.

Initiatives Related to Distribution

Case Study 1

The Lifecycles Project (2004), based in Victoria, B.C., has created an on-line database of food imports to British Columbia. The *Good Food Directory* website is designed to help British Columbians connect with local farmers, producers, and processors of local food and it also helps consumers to be able to call up the average food miles for imports of selected food items, and then provides information on the economic and environmental impacts of the consumers' choices (http://www.localfooddirectory.ca/foodshed/geobrowser/).

Case Study 2

The first grocer in B.C. to offer strictly British Columbia products opened very recently in Courtenay. Brambles Market offers everything from bakery and dry goods to butcher products and frozen foods produced in B.C. It sources from many dozens of suppliers and by the summer of 2009, hopes to be dealing with 150-200 vendors (http://www.bclocalnews.com/business/36013909.html>http://www.bclocalnews.com/business/36013909.html).

Case Study 3

Local Food Plus (LFP) is a non-profit organization operating in Greater Toronto that connects farmers and consumers, with the goal of sharing the benefits of environmentally and socially responsible food production. LFP certifies farmers and processors who produce food in environmentally and socially responsible ways and

opens new markets for them by linking them to local purchasers. LFP works with institutions and food service companies to develop supply chains that foster local sustainable food systems. LFP also educates consumers and others about the benefits of local sustainable food systems.

Local Food Plus believes that focusing on institutional markets is the best strategy to foster local sustainable food systems. Institutions are major players in the food system and their operations often use significant volume as well as predictable and stable demand. As well, institutional purchasers have the ability to leverage their buying power to encourage multiple stakeholders in the food system to participate in developing local sustainable food systems (http://www.localfoodplus.ca/index.htm).

Case Study 4

Savour Ottawa is a joint initiative by the City of Ottawa, Ottawa Tourism and *Just Food* to promote local culinary products and experiences. The initiative aims to bring together food producers, vendors, the restaurant industry, and the tourism sector to develop and promote products, experiences, events and venues that will brand Ottawa and area as a culinary tourism destination.

The initiative is part of an Ontario government strategy aimed at supporting and developing culinary tourism in five regions in the province. Ottawa is one of those areas, along with Toronto, Niagara, Muskoka and Prince Edward County. (http://www.ottawatourism.ca/savourottawa/).

Case Study 5

Conclusions from the NYC Wholesale Farmers' Market Study:

"The study has documented strong interest and enthusiasm for use of a New York City wholesale farmers' market by New York State farmers and city wholesale food buyers. It showed that other world class cities, such as Toronto and Paris, have benefited greatly from the development of public wholesale farmers' markets. It identified significant potential economic benefits of a market for farming regions of New York State, where effective strategies beyond farmland preservation measures are needed for keeping farms in production in the face of strong development pressures. It also projected significant benefits for New York City in terms of economic development, cuisine and culture, food security, and improved access for low income consumers to nutritious food, including those served by government nutrition programs such as the school lunch program" (Market Ventures, Inc. *et al* 2006).

Case Study 6

A number of successful models exist in B.C. and elsewhere for cooperatives, including Saanich Organics, Kootenay Co-op, and the Calgary Farmers' Market New Generation Co-op, which has incorporated storage facilities and a commercial kitchen (Komick 2008).

Recommendations

The following are recommended ways in which distribution can be improved in the region:

- Create a centralized warehouse distribution centre that includes storage and extends the farmers' market season. It could involve specific contracts with a selection of growers that would manage the supply.

- Conduct an assessment of regional consumer demands (i.e., assess the market potential for regionally produced foods).
- Identify infrastructural gaps and other barriers that prevent local and regional farmers from marketing more of their crops, livestock and value-added products within the region.

2.1.5 Processing

Food processing consists of all processes of value-adding or transforming food into food products. It is defined by the B.C. government as "any activity that maintains or raises the quality or alters the physical or chemical characteristics of a material or object, or adds to it in any way whatsoever". Examples of processing activities include washing vegetables, cooking, canning, smoking, drying, and making cheese or wine (B.C. Ministry of Agriculture, Food and Fisheries 2004).

B.C.'s processing sector is relatively small in overall size and is also comprised of individual processing plants that are mainly small in size. Food production is B.C.'s second largest manufacturing industry, producing $1.7 billion in value-added goods in 2006, an increase of 5.8% over 2005. The dairy and meat industries have grown at the fastest rate (BC Stats 2008).

In 2005, there were approximately 98 organic food processors in B.C. Of these, about 15 processors were certified organic operations (B.C. Ministry of Agriculture and Lands 2007). The main difficulty faced by certified organic processors is in obtaining stable and consistent supply of local organic product (Zbeetnoff *et al* 2008). Unpredictable weather and seasonality often create fluctuations in supply. Poor weather has historically affected the quality and volume of yields which, in combination with seasonal production, creates fluctuations in supply that can be particularly significant to the processing market. This results in inconsistent economic returns for both processors and growers (B.C. Ministry of Ag and Lands 2007).

Labour supply and cost are significant issues in B.C. at all levels from production to processing. While the Seasonal Agricultural Workers Program (SAWP) has significantly improved the supply to farm workers, labour supply for processing facilities is more limited and must be priced to competing jobs. B.C. processing labour costs are substantially higher than labour costs in some competing countries, such as China (Zbeetnoff *et al* 2008).

Small and medium-sized processors in the province are faced with competition from external processors and consolidation within the domestic industry. However, it appears that the changing demands of consumer and food service markets, especially hotel, restaurant and institution buyers, may represent an emerging opportunity for small and medium-sized food processors. While consumers have expressed a preference for regionally produced and healthy food products, the food service industry operators are not necessarily responding directly (Zbeetnoff *et al* 2008).

The challenge for a regional food system is to develop a local food producer-consumer relationship through a healthy food processing sector, which provides jobs and economic growth. Since the majority of agricultural products are perishable, processing is one way to extend food supply throughout the year in a variety of forms. Food processing is an important link in the food system and can play a key role in a local economy. It is through the distribution and processing aspects of the food system that the most value is "added" to food. This can increase profit margins beyond that of raw, unprocessed food.

Processing in the North Okanagan

Despite the size of the dairy industry in the region, the majority of milk produced in the region is shipped to Burnaby, B.C. or Airdrie, AB for processing. There are also milk producers who wish to produce an organic product but, because of a lack of processing facilities specific to an organic product, can not justify the added cost of organic feed (Aasen pers. comm.).

The grain industry in the North Okanagan is well integrated and diversified with growers, processors and a transportation infrastructure. The region supports feed processing and flour milling facilities, as well as a number of related value-added processing facilities (e.g., grain and seed cleaning, baked goods, malt for beer, brewing).

Regulatory issues exist that address concerns and/or practises for processors in international trade but have made the path towards cost efficient, smaller scale processing and distribution to local markets more onerous. For example, small-scale livestock processing has been significantly impacted by a recently introduced provincial regulation, the Meat Inspection Regulation (MIR). The regulation stipulates that only meat from livestock slaughtered in a provincially or federally licensed facility can be sold for human consumption and that all animals slaughtered in licensed abattoirs must be inspected both before and after slaughter. The regulation came into full effect in September 2007.

An assessment of the loss of slaughter capacity in the North Okanagan Regional District as a result of the new regulation showed that a number of small processors shut down in the region as a result of several issues with becoming licensed (Johnson 2008). This loss of slaughter capacity, in turn, has resulted in a significant loss of small scale livestock production in the region.

As of the writing of this report, there is only one custom poultry mobile abbatoir serving the North Okanagan. Five custom poultry processing facilities that processed 55,000 to 70,000 chickens and over 5,000 turkeys for close to 800 producers closed after the regulation came into effect. There are 3 provincially licensed poultry facilities in the region; however, they do not process small lot custom poultry.

Before the regulation came into effect, there were 8 custom slaughter businesses for red meat servicing RDNO. Six were fixed plants that also provided cut and wrap services. Four of the custom abattoirs have now closed. Lost custom processing was conservatively estimated to be over 1850 beef; 2775 pigs; 3000 lambs; and 3000 rabbits (Johnson 2008).

In late 2008, the RDNO Board passed a resolution to work collaboratively with the B.C. Food Processors Association toward shared goals related to the need for increased small scale meat processing capacity in the region.

Despite the difficulties in small scale meat processing and production that arose from the implementation of the Meat Inspection Regulation, there is still value-added meat processing available in the region from a number of small scale custom or specialty meat cutters and sausage makers. The exact number of these is unknown at this time.

Initiatives that Improve Processing Opportunities

Case Study 1

There is a Small Scale Food Processors Association in the province. It is comprised of specialty food processors with a vision to create regional food sustainability (http://www.ssfpa.net). The association delivers a food safety grant program to small scale processors and provides discounted member access to business management tools. A number of suppliers of specialty food products are also listed in the Specialty Foods Directory, which is provided by the association (http://www.ssfpa.net/).

Case Study 2

Recently, collaborative food system initiatives in the Vancouver area have identified micro-processing opportunities in the region based on local food procurement. This has resulted in the formation of a new local tomato processing facility, which caters to the needs of chefs who want a locally processed product (Zbetnoff *et al* 2008).

Case Study 3

Co-operatives or collaborative arrangements may facilitate processing opportunities. One successful model is that of Nelson Farms at Morrisville State College in New York (Evans pers. comm). Nelson Farms provides entrepreneurial agri-business opportunities for specialty food processors, farmers, growers, and producers (http://www.nelsonfarms.org/).

Recommendations

Opportunities for enhancing processing include:

- Encourage the use of commercial kitchen facilities in the community that could provide small entrepreneurs with opportunities to build their businesses and develop job skills.
- Ensure that agricultural processing is included in industrial land use planning.
- Pursue an industrial retention policy that both preserves land for food processing uses and that plans for infrastructure upgrades so that food processing companies can maintain high levels of productivity and innovation.
- Assess the current small scale processing in the region (other than meat, which has already been completed) and determine the potential for expansion of local food processing.
- Continue to collaborate with the provincial government to streamline the food processing requirements for custom meat slaughter facilities.

2.1.6 Waste

Waste is a continuous output of the food system, created during the production, processing, and consumption of food. It comprises of any product that is not or cannot be re-used. It includes organic food waste, food packaging waste, as well as waste from agricultural production, including manure, animal carcasses and slaughter waste.

In considering how to strengthen our regional food system, we must consider ways in which we can reduce the waste stream heading to our landfills, as well as ways to support farmers to deal with the waste that is created during agricultural production. Waste management is one of the most critical environmental issues associated with our food system. Local and regional food distribution systems, combined with composting programs and efforts to reduce food packaging, can help combat the inefficient use of land and energy resources.

Food Waste Management and Recovery

As the final step in the movement of food through human communities, food waste can be both a community output (as discarded or landfilled waste) and an input back into the food system (as a recoverable resource capable of being converted into compost or other recyclables). Food waste management and recovery is the series of activities where discarded food materials are collected, sorted, processed and converted into other materials and used in the production of new products. A critical component of a sustainable food system is the diversion of food waste from landfills. The waste stream can be reduced by diverting reusable or compostable food wastes and showing people how to recycle or sustainably dispose of leftover food, food scraps, and food-related packaging and material wastes.

Reducing food waste in general, as well as increasing the amount of food residuals that are diverted from landfills can have a number of environmental, social, and economic benefits, including:

- Reducing pollution and the consumption of non-renewable materials within a community.
- Generating needed compost for urban and rural agriculture production.
- Reducing greenhouse gas emissions generated by landfills, which are created primarily by the anaerobic decomposition of organic material.
- Reducing trash collection and disposal fees for individuals and businesses.
- Ensuring that edible food is redistributed to those who require emergency food provision.

Waste Management in the North Okanagan

Food Waste

The RDNO owns three operational and three closed recycling and disposal facilities (RDFs) in the region and is the co-permittee/leasee of one RDF.

A 2005 study of the composition of residential waste in RDNO showed that nearly 25% (~5682 tonnes) of the waste coming to our region's landfills was food waste. In an effort to reduce this waste stream, the Regional District of the North Okanagan completed an Organic Waste Strategy in 2008, as part of an overall solid waste management strategy (Gamble 2008).

The organic waste strategy consists of thirteen specific programs that focus on reducing the amount of organic waste that requires centralized management, the collection of organic wastes, and the processing organic wastes. The primary goal of the strategy's reduction programs is not to prevent the generation of organic waste, but rather to reduce the amount of infrastructure needed to manage it. Other components of the overall solid waste management strategy, specifically education and outreach programs, will encourage waste generators to

reduce consumption of resources and otherwise change their personal habits to reduce generation of waste (Gamble 2008).

Once a regional yard waste composting program has been established (expected by summer 2009) and is successfully operating without creating nuisance conditions, the RDNO will consider expanding the scope of materials accepted to include specific residential food wastes. Incorporation of food waste diversion would involve changes to promotion and education programs, collection programs, and to the composting operation itself. There are many successful examples of such programs in Ontario and Eastern Canada, which could be used as models for this.

The strategy also recommends that the RDNO encourage the private sector to develop organic waste management facilities to service commercial, industrial and institutional (IC&I) sources and agricultural waste generators. This can be done by providing non-monetary support and information on waste sources and quantities to prospective developers, and by establishing policies and bylaws to create a framework for facilities to operate within, including land use criteria in zoning bylaws. The latter should include bylaws to supplement existing provincial regulations to protect against environmental impacts, nuisances, and impacts on resident's quality of life (Gamble 2008).

Organic wastes generated by residents are typically very easy to divert due to the nature of collection systems and municipal controls/responsibilities that are in place. On the other hand, organic wastes from IC&I sources are more difficult to capture since the generators of waste are responsible for themselves, and collection programs are often fragmented amongst many private contractors. Despite this, IC&I organic wastes present a significant opportunity for diversion and often the waste makes excellent feedstocks for composting or anaerobic digestion facilities. It is estimated that there is in the order of 9,000 to 12,000 tonnes of organic waste generated by the IC&I sector in RDNO (Gamble 2008).

Implementation of the Organic Waste Strategy would have indirect benefits to the region including the following:

- landfill airspace is preserved for wastes which have no reuse/recycling options
- greenhouse gas emissions associated with landfills would be reduced
- fire hazards within the landfill cells are reduced
- traffic at RDF's is reduced
- convenience to customers is increased
- helps to increase overall environmental awareness
- self sufficiency of individual waste generators is increased

Agricultural Waste

The B.C. Ministry of Agriculture and Lands, the B.C. Ministry of Environment, and the Canadian Food Inspection Agency have jurisdiction over agricultural waste and are guided by the Agriculture Waste Control Regulation. The Agriculture Waste Control Regulation oversees the application of manure to land and the composting of mortalities that die on the farm. Specified risk materials (SRM) disposal off-farm are also regulated by the Organic Matter Recycling Regulation - Schedule 12 and the Agricultural Land Commission. Farm generated slaughter wastes can be managed on-farm through several methods, including Ministry of

Environment approved on-farm landfills, composting or incineration and off-farm through a variety of resources (SYLVIS 2006).

Composting

Composting of slaughter waste is regulated under the Organic Matter Recycling Regulation - Schedule 12, which allows for poultry carcasses, offal and viscera, as well as red meat waste, to be used as compost feedstock. Cattle carcasses and compost made from them are additionally regulated and handling practices are restricted because of the discovery of Bovine Spongiform Encephalopathy (BSE) in the Canadian cattle herd. Though cattle carcasses can be completely composted within 10 months, any carcasses that might contain SRMs must remain on-farm and the compost may not be applied to land that will be grazed by ruminants for five years.

Poultry wastes, which can be completely composted within 2 months, can be applied in accordance with Best Agricultural Practises and the Agriculture Waste Control Regulation (Ruth MacDougall pers. comm.). However, the 'Code of Practice for the Slaughter and Poultry Processing Industries' requires a $100 annual fee to register a docking station (required for a mobile abbatoir to slaughter on-farm) and an additional $100 annual fee to landfill the waste on farm. To the small scale producer, these fees represent an unnecessary expense that simply adds further the already increasing cost of doing business.

There are several on-farm composting facilities within RDNO boundaries (Gamble 2008).

Landfill

Non-renderable material (game and sheep heads) is accepted at the Armstrong/Spallumcheen Regional Landfill and is segregated into a lined, limed pit at an extra disposal charge.

Rendering

Rendering remains an alternative for disposal of slaughter waste, however, with BSE, it has become a very expensive disposal option. A trucking service exists for renderable material, which is transported for a fee to rendering plants in either Calgary or Vancouver. As a result of the new BSE related requirements and the lack of cost effective local handling alternatives, slaughter waste has moved from being a net income generator for processors, when it could be shipped to a local rendering facility, to a significant expense. This represents a further burden for small-scale cattle producers in the region, who are finding the combined higher costs of production, slaughter, and waste disposal increasingly difficult to overcome.

Anaerobic Digestion

There is a private initiative, in conjunction with a local dairy farm, in Spallumcheen to build an anaerobic digester. This is expected to be operational in 2009.

Incineration

There is the possibility of individual farms having there own incinerators, which can be used for waste disposal and energy generation. A demonstration project for one such incinerator, known as the INCINER8 burner, is underway at a small scale slaughter plant outside of Williams Lake.

Initiatives to Reduce Waste

Case Study 1

Kamloops FoodShare is a program of the Kamloops Foodbank, which collects food from local restaurants, grocery stores, and individuals and distributes it each day to Food Share partners. Funding initially came from Service Canada, but the program now relies on public donations and partner delivery fees. Since excess food is collected daily, it is distributed to other community organizations that provide food for the hungry in Kamloops.

Case Study 2

City Farmer runs the Vancouver Compost Demonstration Garden and offers worm bins for residents without access to backyard composting. Workshops on composting and water conservation are available throughout the year. Website: www.cityfarmer.org.

Recommendations

Recommendations related to waste issues in the region include the following:

- Determine opportunities and barriers to providing cost-effective waste management facilities or alternatives for slaughter waste.
- Work with the provincial government to ensure that waste management regulations and associated costs related to custom slaughter facilities (particularly mobile abbatoirs) are not prohibitive.

2.1.7 Economic development

The food system represents a large part of a local economy, including retail and industrial jobs and a variety of entrepreneurial opportunities. In all aspects of the food system, there exist opportunities for economic development and contributions to a "green jobs" economy, one which connects workers with an industry that promotes environmental sustainability and innovative market development (e.g., linking regional food processing to local food distribution, creating markets and jobs for re-used and recycled materials, expansion of food wholesaling and distribution activities with a focus on local food).

Recruitment and retention of retail food system related establishments and agriculture related businesses can strengthen the local economy through the creation and retention of jobs and the re-circulation of financial capital. It can also encourage marketing and processing practices that create more direct links between local producers and consumers.

The Economics of the RDNO Food System

Primary agriculture in the Regional District receives gross farm receipts of over $100 million/year. Using a conservative multiplier effect of 2, this provides an economic contribution to the local economy of over $200 million/year, making agriculture a major contributor to the regional economy.

Opportunities exist to improve the economic viability of our regional food system, especially as public concern grows over the health, safety and ecological impact of the industrial agricultural industry and its food products

(Garnett 2003). However, our regional agricultural sector is under extreme pressure from urbanization and the globalized, industrialized farm economy. The dominant food system does little to support small scale farming and a local food economy. Local farms located in the pockets of productive land that are found in the larger mountainous and forested landscape of the North Okanagan are struggling to compete with larger, more industrialised farms.

Large industrial farms and industrial scale food processing enjoy economies of scale in food production and processing. As food production becomes more technologically sophisticated, farmers are able to yield high levels of crops. Yet this technology is expensive, thus making it out of reach for all but large-scale farms. In the North Okanagan, like other rural areas, the impact of falling agricultural commodity prices, rising input costs (e.g., equipment, labour, gasoline), shifting trade dynamics, and regulations are adding to the challenge faced by small producers. We are seeing drastic declines in farm numbers as a result.

Small operations are challenged by limited economies of scale, including the following:

- increased per unit production costs
- difficulties in accessing appropriately sized labour-saving tools and implements
- capital is spread over small production units (supplemental off-farm income is often required to remain viable)

Also, poor weather has historically affected the quality and volume of yields which, in combination with seasonal production, creates fluctuations in supply that can be particularly significant to the processing market. This results in inconsistent economic returns for both processors and growers. Often, competitors in the US and Mexico are able to use their longer growing season to produce a consistent year-round supply from multiple crops per year (B.C. Ministry of Agriculture and Lands 2007).

The economic feasibility of farming in the North Okanagan is also challenged by the capital cost of land (Penner 2008), where prices vary from $40,000 - $50,000/acre for parcels under 10 acres (Thomason 2007) to $10,000-$15,000/acre for parcels over 100 acres (Holmes pers. comm.).

There also exists an inherent contradiction within our regional food system regarding the price of locally produced food. Currently our federal agricultural policies work towards keeping the price of food low while, at the same time, we see within our region a growing dependency on charitable food agencies. This means that the low prices that make farming at a small scale uneconomical are still failing to address the issue of food insecurity. There is no easy solution to this contradiction.

Small scale farmers are struggling to survive and many are going out of business. It is imperative to the maintenance and enhancement of our regional food system that we find ways to ensure that small and medium sized farms are economically viable. Existing assets and future opportunities for a North Okanagan food economy are discussed in the following sub-sections.

Farmers' Markets and Agri-tourism

Farmers' markets and agri-tourism operations provide direct sources of revenue, higher prices and greater control over the economics of farming. Farmers also diversify their skills, gaining marketing and business expertise, as well as increased networking and learning opportunities with both customers and other farmers. Money circulates in the community and reinforces local jobs and businesses (Bullock 2000).

Agri-tourism operations and the farmers' markets provide memorable experiences connecting visitors and residents alike to the local bounty and diversity of farms, ranches, orchards and vineyards. The North Okanagan region is blessed with existing resources to enable it to become a "food destination", positioned between the wine production area to the south and the ranching area to the north. It is already well known as a tourist destination as a result of its natural beauty and proximity to recreational areas. The potential of agri-tourism is included in the August 2007 Strategic Plan for Economic Development in the Regional District North Okanagan.

Infrastructure Support

Maintaining the economic viability of agricultural operations in the region in turn sustains an agri-business infrastructure, including feed companies, equipment dealers, seed cleaning operations, and other farm suppliers.

Research

The federal Pacific Agri-Food Research Centre in Summerland is home to a renowned plant breeding program and conducts innovative food processing research, in addition to research on horticultural and field crop production, cellular and molecular biology of plant pathogens and soil conservation. The Sterile Insect Release program has successfully reduced the codling moth (orchard pest) population while reducing organophosphate pesticide use.

Organic Production

This area has an innovative and vibrant organic farming community, which has several outreach programs including a mentoring program for new organic farmers, on-farm research projects, an active listserve, and regular market updates. This region is also home to the provincial organic industry office, two certifying bodies and the provincial organic extension agent.

Land Conservancy

A number of communities in B.C and elsewhere have explored various land conservancy initiatives in an attempt to mitigate the capital costs of land for agricultural operations. Over 20 community farms exist in B.C. alone. These are multi-functional farms where the land is held "in trust" rather than owned by one individual. Land co-operatives exist in the USA, UK and Australia and vary from under 10 acres to over 500 acres (Vallillee 2003). There are many projects in the U.S. using conservation easements or land trusts to preserve farm land or ecologically sensitive land. Some of these are publicly owned by local government while others are owned by local land conservancies or private citizens (Schultink 2007).

Corner Store Conversions

The authors of Oakland, California's food system assessment suggest that "corner store conversions" offer significant local economic development opportunities through the expansion of produce and other fresh, nutritious food sales. "Corner store conversions have the potential to contribute to store revenue as well as creating positive relationships between retailers and the community, by becoming major community assets. A special focus might be corner stores near schools, where children stop to purchase after-school snacks and where the availability of healthy, fresh food choices is especially important" (Unger and Wooten 2006).

Urban Agriculture

Urban agriculture can be the source of micro-enterprise development, creating business in areas such as food processing and preparation, agricultural supplies and garden consulting. Urban agricultural production activities can provide long-lasting job skills and land that is otherwise fallow can produce high-value specialty crops, which in turn earn income that contributes to the overall local economy. Urban gardening and

landscaping can beautify an area, which, in turn, attracts businesses and residents. Community gardening can be seen as a factor contributing to quality of life, thereby attracting businesses and residents (Bellows 2006 and Roberts 2001).

Policy and Planning

The City of Vernon will be creating an Economic Development Strategy in the next months and this represents a key opportunity for the largest urban centre of the region to consider ways to strengthen the food system through related economic development activities.

The Consumer

Consumers play a significant role in a local food economy. Consumers directing a portion of their food purchases locally will increase the number of dollars circulating among local businesses. Furthermore, increasing the number of dollars that circulate locally increases the number and strength of community linkages, which provides for a healthier, more diverse and resilient local economy. Locally directed buying and selling connects the community's resources to its needs, resulting in relationships that serve to strengthen and stabilize the community (Ontario Healthy Communities Coalition 2006).

Recommendations

Recommendations for developing economic opportunities within our regional food system include the following:

- Explore business models that link farmers to larger volume markets and determine the barriers to the implementation of these business models.
- Create local government policy that would help with the location/expansion of urban food production and processing opportunities (e.g., streamlining fees and permitting process).
- Investigate the potential for a wholesale market that incorporates food processing.
- Develop an incubator program to connect job training and food (e.g., tie urban food production and processing together into an entrepreneurial urban agricultural and kitchen incubator).
- Through collaboration and partnerships with all levels of governments (local, provincial, and federal), community groups, and private industry, promote and support economic development initiatives related to agri-tourism and culinary tourism.
- Encourage all local business to be a part of the regional food system through purchasing and promotion of local food.
- Support local producers to market their products online.

Policy and planning

The word policy refers to a plan of action that guides the decision-making of individuals, organizations and governments. Policies reflect our values and can take many forms, including guidelines, rules, regulations, laws or principles (www.socialjustice.org).

Policy and planning tools can help to create new opportunities and tailor existing ones so as to strengthen a regional food system. A food system plan such as this one can be used as a tool to better understand the connections between food system mechanisms and outcomes, which can then be used to formulate policy and activities to help achieve desired outcomes. Policies can be developed to address any number of issues related to the food system.

Governments at all levels are adopting policies in regards to healthy communities and food systems. Examples of some of the policy documents currently in place, or in process, at the federal, provincial, regional and local government levels are listed below.

Federal

One example of food policy development at the federal level comes from the Liberal Party of Canada. On January 23, 2008, Members of Parliament from the Liberal Party will be holding an e-summit in order to consult with any interested member of the public 'Towards a Comprehensive Food Policy for Canada'. The summit will be divided into the following key discussion areas:

- The Global Forces of Food Security
- Ecological Threats to Food Security
- Food Production/Distribution
- Food Safety and Public Health
- Food Security and Poverty: Pay the Rent or Feed the Kid?

Provincial

The B.C. Agricultural Plan was recently published and is a document that "reflects the values and concerns that the public and farm community voiced to the Agriculture Plan Committee about the future of agriculture in British Columbia. It provides a vision and direction for sustaining farm families, improving profitability through direct farm marketing, while playing an important role in reducing the greenhouse gas emissions that contribute to climate change". The plan contains 23 strategies within 5 overarching themes. Two of these themes relate more directly to a regional food system and are listed below.

The strategies listed in *Producing Local Food in a Changing World* include:

- Promotion of B.C. agriculture and food products at the provincial and local levels.
- Implement initiatives to strengthen community food systems.
- Implement initiatives to improve childhood health using B.C. agriculture and food products.
- Promotion of human, plant and animal health, and food safety.

The strategies listed in *Bridging the Urban/Agriculture Divide* include:

- Increase awareness and interest in agriculture and food among B.C. youth.
- Preservation of agricultural land for future generations of farm and ranch families.
- Implement strategies to minimize conflict between rural and urban residents.
- Increase agriculture industry input at the local government level.

ActNow BC is a health and wellness initiative launched by the British Columbia government in March 2005. It is a multi-year initiative involving several ministries, 2010 Legacies Now, the British Columbia Healthy Living Alliance, community organizations, and businesses throughout the province. The aim of ActNow BC is to make British Columbia the healthiest jurisdiction to host an Olympic and Paralympic Winter Games by targeting risk factors for chronic disease and taking integrated action to reducing these risk factors (http://www.actnowbc.gov.bc.ca/media/ActNowBC_Baseline.pdf).

Planning for Agriculture is one component, along with *Farm Practices Protection*, of the **Strengthening Farming Program**. It is broadly focused on developing strong working relationships between local governments, the farm community and the province to ensure that agriculture is given appropriate consideration in local government planning processes.

New legislative tools in the *Local Government Act* and *Land Title Act* have been designed to provide local governments with improved opportunities to ensure a climate of security and stability for farming and ranching in their communities.

Regional and Local

In January 2008, the Regional District of the North Okanagan established a *Terms of Reference* that would outline and guide the planning process for a **Regional Growth Strategy**. The Growth Strategy is intended to provide a land use plan, based on sustainable principles, which will guide decisions on growth, change and development for the region. The strategy will focus on several key growth issues, which were identified by elected officials, the broader community, interest groups and planners in the region. One of the key issues identified was ‘Agriculture and Food Systems’.

City of Vernon’s Official Community Plan (2008) is based on Smart Growth principles and includes a section on Agriculture and Food Access. In 2008, the City of Vernon Council resolved to consider adopting a Community Food Charter and to support Food System Planning in the Regional Growth Strategy. The city has since provided funding for the development of a food charter and food policies. This is currently under development and is intended to be presented to Vernon City Council in early 2009.

The Regional District of the North Okanagan (GVAC) has received funding from the Union of B.C. Municipalities to complete a Healthy Food and Beverage Sales initiative in public buildings (http://www.bcrpa.bc.ca/HealthyFoodandBeverageSales.htm).

The Township of Spallumcheen has an Agricultural Area plan. The District of Coldstream is in the process of creating a plan and the City of Vernon will begin creating its Agricultural Area Plan in early 2009.

The City of Armstrong has received funding through the Union of B.C. Municipalities Community Health Promotion grant to implement a community garden and explore food security and food systems planning.

Food Policy Councils and Food Charters

Food policy councils and food charters have been identified as one of the most successful methods that communities can use to build their local food systems into rich community resources. Food policy councils are created through a diverse partnership of stakeholders, concerned citizens, businesses and organizations that collectively represent a community or region. These "think tanks" have been used to bring stakeholders together, make recommendations to various government agencies, address policy barriers, coordinate and deliver existing programs, as well as create new programs and engage in community outreach in order to build ongoing food security (Dillon 2007 and Ontario Healthy Communities Coalition 2006). Food policy councils exist in a number of Canadian communities including Kamloops, Kelowna, Vancouver and Toronto.

Food charters are policy reference documents that present a vision for a just and sustainable food system that has been developed by the community and endorsed by the community's decision makers. Food charters anchor municipal commitments to sustainable food system policies and provide guidelines for decisions about food. They are tools that link policy and community action and provide a reference for managing food system issues on a system-wide basis (Joughin 2008). Food charters combine vision statements with principles or guidelines, background and rationale, and action goals. They are useful in that they activate civic engagement through the creation of opportunities for conversations about food. This engages public participation to address food system challenges and facilitates inclusiveness, thereby extending the range of influence and action. Food charters articulate an overall vision for food policy by bringing together separate policy areas (e.g., land use and zoning, waste management, health and food safety) and informing projects that benefit local economies and the environment.

In summary, food charters are intended to achieve the following:

- Provide statements of values, principles and priorities used to point community food policy in a positive direction.
- Bring together a diverse group of citizens and enable them to share their concerns and desires around food and agricultural issues in order to reach a shared vision of food security.
- Take the voices and visions of community members and put them to paper. The end result is a community-owned and locally focused action plan to build greater food security. Both the document itself and the process used to create it are important to opening the discussion on food security issues, and mobilizing political will to advocate for change (http://nklcss.org/foodcharter.php).

Municipal governments in Canada that currently have food charters (as of January 2007) include: Toronto, Sudbury, Saskatoon, Prince Albert, Kamloops, and Merritt. The Saskatoon Health Region recently adopted a Food Charter. Ottawa, Montreal, Vancouver, the Capital Regional District, the Province of Manitoba, and the Province of Saskatchewan are currently developing and exploring the adoption of food charters. As well, a proposal was recently presented to the House of Commons to adopt a Canadian Food Charter (http://nklcss.org/foodcharter.php). Kaslo's recently adopted Food Charter can be found in Appendix 1.

Most charters were brought forward through working groups that consisted of local food security networks, city councils, professionals in health and community citizens. How they are created and implemented varies with each community. Toronto and Vancouver have food policy councils that exist under the local government. In other cases, food security groups share the responsibility with food policy councils to oversee the food charter. Outside of Canada, Oakland California adopted a food policy that mandates that, by 2015, 40 percent of the vegetables consumed in the city will be grown within a fifty-mile radius of city center.

Procurement Policies

The report entitled, *Local Food Procurement Policies: A Literature Review*, examines the environmental, economic and social benefits of local food, showcases existing procurement policies in Italy, Britain, the United States, and Canada, and examines lessons learned in other jurisdictions. It is a preliminary review of some literature on local food initiatives and demonstrates that, given the size and stability of government operations, government procurement policies can help support local agriculture by providing a large, stable market for producers (MacLeod and Scott 2007).

Recommendations

In terms of policy and planning, it is recommended that all jurisdictions:

- Develop and implement a Food Charter (or Food Policy), which provides a broad vision and set of principles designed to lead towards greater food security and food self-reliance for the community and enhance the health of residents. It should include initiatives designed to improve the accessibility of quality and quantities of food required for health and well-being.
- Integrate food system planning and policy development with other government services.
- Collaborate with businesses to establish local food purchase policies that will promote health and improve the local farm economy (see Model Policy in Unger and Wooten 2006).

It is also recommended that:

- A Regional Food Policy Council is formed. It is likely key to the successful implementation of the strategies that stem from this Plan.
- Consideration is given to the creation of a contract position of a Food System Planner. This position would provide consistent support to a largely volunteer Regional Food Policy Council and could also support jurisdictions in the region that have (or are working towards) Agricultural Area Plans.

2.1.9 Productivity and Land Stewardship

A key goal for any community or region striving to enhance the strength and resiliency of its food system is to encourage and support sustainable farming practices and land stewardship. Environmentally responsible practices and the use of appropriate technologies will help to protect the land, air and water resources, protect the ecological role of farmland, while also enhancing the effectiveness and competitiveness of agricultural operations.

The importance of sustainable farming practices is recognized nationally. As part of Canada's National Environmental Farm Planning Initiative, the *National Farm Stewardship Program* provides technical and financial assistance to support the adoption of beneficial management practices by agricultural producers and land managers. Beneficial management practices are farm management practices that:

- minimize and mitigate impacts and risks to the environment, by maintaining or improving the quality of soil, water, air and biodiversity
- ensure the long term health and sustainability of natural resources used for agricultural production
- support the long-term economic and environmental viability of the agriculture industry

In the province of B.C., the *Environmental Farm Planning Program* is a partnership between Agriculture and Agri-food Canada, the B.C. Ministry of Agriculture and Lands, and the B.C. Agriculture Council. The aims and objectives of the program are to:

- Encourage farmers and ranchers to be better stewards of the land.
- Ensure the future of the B.C. agricultural industry through the further implementation of Beneficial Management Practices.
- Foster partnerships with agencies.
- Be a proactive process to help farmers and ranchers identify environmental opportunities and risks on their own land.
- Raise awareness of progress being made on the land.
- Improve farm profitability.
- Be confidential and voluntary.
- Improve the public perception of agriculture.
- Reduce conflicts between agriculture and environmental interest.
- Reduce wildlife impacts to agricultural lands.

Initiatives that Promote Land Stewardship

Case Study 1

A program in B.C. that promotes the conservation of agricultural land and wildlife resources is the Delta Farmland and Wildlife Trust, whose mission is "to promote the preservation of farmland and associated wildlife habitat on the Fraser River Delta through sustainable farming and land stewardship". Some of the stewardship programs offered include the following:

- **The Grassland Set-aside program** offers farmers the opportunity to leave fields sown with a mix of grasses and clover for a period of up to 4 years. Soil organic matter and surface structure can be restored while simultaneously providing valuable wildlife habitat

- **The Cover Crops program** is intended to benefit soil conservation by protecting delta soils from the heavy winter rains that typically occur in the area. While reducing significant erosion over the winter, the cover crops also provide organic matter to be ploughed into the soil prior to spring planting, thereby improving soil structure and contributing to higher productivity. These crops provide an abundance of winter forage for the dense populations of waterfowl that congregate in the delta during winter months.

- **Field Margin Stewardship programs** help farmers to retain and rebuild field margins (e.g., ditches, grass margins and hedgerows) in an effort to improve wildlife capacity. Over half of the bird species found on a typical piece of farmland can be attributed to hedgerows, even though the hedges may comprise only a small portion of the available habitat. Benefits to farmers include prevention of soil erosion by becoming a wind and rain barrier, providing a microclimate conducive to improving field productivity and in some instances providing shade and barriers for livestock (http://www.deltafarmland.ca/dfwt2.html).

Case Study 2

In the Okanagan-Similkameen region, The Land Conservancy's *Conservation Partners Program* works together with numerous other conservation organizations on stewardship and landowner contact programs. The focus of their efforts is on the protection and restoration of a variety of important habitats, including riparian cottonwood and water birch forests, wetlands, sagebrush grasslands, ponderosa pine forests, and antelope brush grasslands. *TLC* also works to educate the public about the close relationship between conservation and agricultural issues in the area, so that consumers can support the efforts of local farmers who actively steward their land (http://www.conservancy.bc.ca/content.asp?sectionid=165).

Case Study 3

Ducks Unlimited Canada took a unique approach to conservation when it began the *On-Farm Planning Program* on a pilot basis in the Fraser River Delta in 2001. The program involves the development of individualized long-term agreements with specific farm landowners to share the cost of various land management activities. These activities are to enhance the habitat for migratory waterfowl and to improve the sustainability of soil-based farm operations. By 2003, the program had expanded to Delta, Comox, Port Alberni and was in the planning stages for Victoria (www.ducks.ca/aboutduc/news/archives/prov2003/030812b.html). The program represents a viable alternative to costly land acquisitions through stewardship partnerships over the landscape (http://www.ducks.ca/province/bc/how/ground/pdf/farm.pdf).

Case Study 4

The Land Stewardship Project (LSP) is a private, nonprofit organization founded in 1982 in Minnesota to foster an ethic of stewardship for farmland, to promote sustainable agriculture and to develop sustainable communities. Their work is concentrated on four areas, including Community-based Food and Economic Development, Farm Beginnings, Policy and Organizing and Stewardship Science. LSP is a grassroots membership organization made up of farmers, as well as rural and urban residents working together to:

- secure a healthful food supply
- preserve soil, water and wildlife
- support diversified, profitable family-sized farm,
- organize communities for positive change
- hold corporations and government accountable
- create a new sustainable vision for our food and agriculture system (http://www.landstewardshipproject.org/index-aboutus.html).

2.1.10 Urban Agriculture

The term urban agriculture, as it is commonly used, refers to any agricultural production that takes place within the urban and peri-urban region. This could include the growing of food (vegetables, grains, mushrooms, even meat and dairy products), medicinal plants, herbs, and ornamental plants. It includes a diverse array of techniques and approaches ranging from backyard growing to large-scale urban market gardening, hydroponic greenhouses and aquaculture. It is not just community gardening, although this is an important component in many cities (Holland Barrs 2002).

Urban agriculture has many beneficial functions such as entrepreneurial food production, recreation, education, neighborhood beautification, gathering spaces, and community building. It also contributes to a sustainable urban environment by improving soil and air quality, supporting biodiversity by providing habitats for insects and birds, and reducing high temperatures caused by the heat island effect.

Additionally, growing and distributing food within cities decreases energy needs and the costs associated with the long distance transportation and conventional growing methods of food. Though community gardening can be considered a component of urban agriculture, it should not be confused with gardening for urban food production. Community urban food production attempts to maintain a sustainable food chain within a shorter area by producing, processing, selling, and composting food within a neighborhood or city (Unger and Wooten 2006).

There are also many economic benefits associated with urban agriculture. Public land dedicated to urban agriculture is maintained by community members, leading to reduced costs of maintenance to the local government. Costs related to the transportation of food are reduced, local employment opportunities are created, and other business may be attracted to the community (e.g., those related to agri-tourism, processing facilities, restaurants, markets, shops).

One particular issue that has been raised locally is that of backyard livestock. There is growing interest in the keeping of urban chickens, especially laying hens for egg production. They are easy and inexpensive to keep and, while they provide a good source of protein, they also provide a higher use for food scraps (rather than straight into the compost bin) which generates potent fertilizer (manure) for the garden. Chickens also provide an organic pest control for backyards. The RDNO does not allow the keeping of livestock on parcels zoned residential and less than one acre in size.

Recommendations

It is recommended that all municipalities in the RDNO support and encourage urban and peri-urban agriculture through food system planning, including the following:

- access to grocery stores in the development and redevelopment of neighborhoods
- density bonuses and tax credits for developers who incorporate urban agriculture or food markets into their designs
- the creation of urban agriculture guidelines
- the support of leasing vacant or under-utilized publicly owned land to growers
- the use of buildings (roofs, walls, balconies) for food production

- the incorporation of urban gardens and rooftop gardens into integrated stormwater management plans
- bylaws that permit a limited number of laying hens in urban backyards

It is recommended that, through collaboration and partnerships with all levels of government (local, provincial, and federal), community groups, and private industry, the following initiatives be implemented:

- community and neighborhood gardens
- introduction of edible landscapes on private and public space (including boulevards and neighborhood greenways)
- urban agriculture on under-utilized public land and in private developments
- green roofs and rooftop gardens, where appropriate
- the development of urban agriculture pilot projects on public property
- the application of land trusts and conservation covenants for private and public lands in urban areas dedicated to food production

2.2 Health and the Consumer

A key benefit to strengthening our regional food system is the positive impacts it could have on individual and community health. The Provincial Health Officers Annual Report 2005, entitled *Food, Health and Well-being in British Columbians*, states that, despite the complexities of food and nutrition, it is now clear that poor food choices can be a significant risk factor for chronic disease. The report cites many studies that connect a diet lacking in fresh, healthy food to higher incidences of chronic diseases such as cancer, cardiovascular disease, type-two diabetes, an overweight condition and obesity. Chronic diseases, many with diet as a prominent risk factor, now make up 80% of the disease burden in North America.

The *Food Security Assessment and Action Pla*n (2007) discusses some health-related statistics for the Okanagan Health Service Delivery Area (North, Central and South Okanagan) from 2003. Significantly, the Okanagan fell within the worst 25% of the province in several categories, including the number of men who eat less than 5 portions of fruits and vegetables per day and the number of total people who eat less than 5 portions of fruit and vegetables per day.

Increasing accessibility to healthy foods will also benefit a community economically. When people are eating well, it builds social capital and improves health and vitality of individuals and the community. Conversely, the healthcare costs of diet-related chronic disease can place a significant burden on governments and taxpayers. Additionally, a poor diet can limit a person's ability to contribute to the community, or even perform the tasks of daily living.

Children are particularly vulnerable to the effects of poor nutrition. Inadequate nutrition, namely iron deficiency, during early childhood can lead to permanent cognitive damage, affecting the ability of children to learn and function (Grantham-McGregor and Ani 2001). A recent Nova Scotia study showed that school children whose diet quality was of the lowest one-third of their class were 40% more likely to fail a literacy test than those whose diet quality was in the top one-third of the class (Veugelers 2008).

In 2007 (Aasen, pers. com.), an informal survey filled out by administrators in School District #22, which serves the communities of Vernon, Coldstream, Lavington, Lumby, and Cherryville, revealed an estimate of food insecurity among students ranging from a few students in some schools to up to 50% in those schools with greater need.

Given the connection of health and diet, it is important that healthy foods are accessible and affordable for all members of a community. A stronger and more sustainable regional food system would be inclusive and provide the means and tools to enable a healthier and a more regional diet for local consumers.

In order to strengthen the system, it is important to first consider what factors influence a consumer's ability and choice to access a more regionally-based diet and then determine ways in which consumers can be better accommodated by and engaged in their local food system. The following sections will focus on three food system planning areas that are particular to influencing the consumer: food security, food literacy and consumer engagement.

2.2.1 Food Security

Food security is a term that refers to the ability of all people to obtain a healthy diet. At the World Food Summit in Rome, Italy in 1996, food security was defined in the following way:

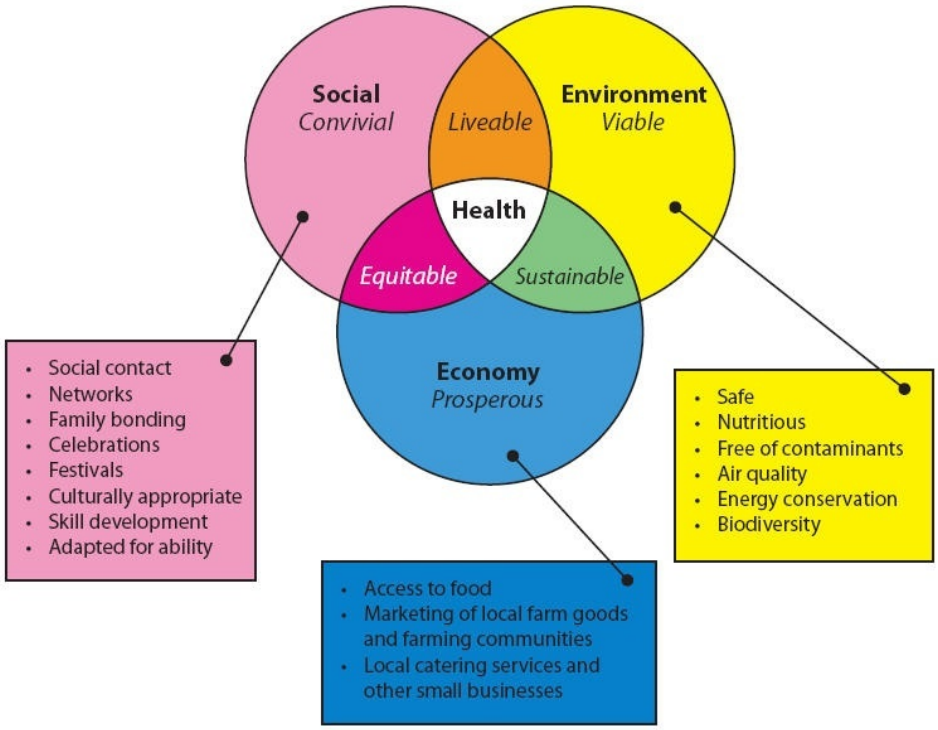
> ***"All people at all times having physical and economic access to sufficient, safe and nutritious foods to meet their dietary needs and food preferences for an active healthy life."***

At the community level, definitions of food security tend to take a much broader food system approach, with stronger links to agriculture and food production within a local system. A widely accepted definition, adapted from Bellows and Hamm (2003) is as follows:

> ***"Community food security exists when all citizens obtain a safe, personally acceptable, nutritious diet through a sustainable food system that maximizes healthy choices, community self-reliance and equal access for everyone."***

Community food security programs address the social, economic and environmental determinants of health (see Figure 4).

Figure 4. The Social, Economic, and Environmental Determinants of Health (from Ontario Healthy Communities Coalition 2006)



Poverty and low income

In B.C., an estimated 23 % of children live in poverty and17% of individuals are considered food insecure (Provincial Health Officer 2005). Members of our community that are most likely to be affected by food insecurity include:

- People on social assistance
- People who are under-employed (the working poor)
- People with disabilities
- Seniors
- New immigrants
- Children

The North Okanagan, when compared to the rest of B.C., shows a higher proportion of elderly people, single parents and persons without high school completion and a significantly higher proportion of recipients of income assistance and employment insurance benefits (Nyberg-Smith 2007).

The 2006 median individual income was 6% below the provincial average and the 2006 median family income was also below the provincial average (Neilsen-Welch 2007).

Cost of Healthy Food

Currently, local and organic food, because of the higher production costs, is often more of a "niche" market that is less accessible to people of lower income. Higher food prices and a recent economic downturn may increase levels of food insecurity in the future.

The *Cost of Eating in B.C.* report (Dieticians of Canada 2007) states that for those families with low incomes, especially those who are receiving income assistance, there is not enough money to buy healthy food. For example, a family of four on income assistance would use 42% of their income to buy the food basket (the federal government's standardized food costing tool, the *National Nutritious Food Basket 1998* (NFB), based on the 1992 version of the Canada's Food Guide). A family of four with one low earned income would use 31% of their income to buy the food basket and the same family of four with one average income would use 17% of their income to buy the food basket.

Affordable/Attainable Housing

Due to the rising costs of housing and the disproportionate amount of monthly income needed to secure housing, more people are homeless, and more people cannot afford to buy the amount or quality of healthy food needed for vitality.

The City of Vernon's *Attainable Housing Strategy* (Neilson-Welch 2007) reported that approximately 20% of homeowners were in core housing need (i.e., spend more than 30% of their gross income on housing) and over 50% of renters were in core housing need. In Vernon in 2007, the median price for a single detached home was $375,000, which would require a household income of $98,000 to purchase. However, the median income was $24,050 for an individual and $55,000 for a family.

Homelessness in the North Okanagan has become increasingly prevalent and it is estimated that the number of those without shelter has almost doubled since 2004. Research indicates that there are between 80-100 absolutely homeless individuals living on the streets of Vernon with 150-200 additional individuals that are relatively homeless. Cumulatively, at least 400 individuals were turned away from all shelters in 2006 (Social Planning Council of the North Okanagan 2007).

Transportation and Neighbourhood Design

The ability to access fresh, healthy and/or local food is influenced by transportation routes and community design. A city's transportation system not only distributes food and waste products, but also determines the accessibility of food distribution outlets (e.g. restaurants, grocery stores, farmers markets, food banks) for many residents. More compact neighbourhoods enable transit and other sustainable forms of transportation, increasing accessibility to food.

Rural communities often face unique challenges in terms of transportation, food security and access. Efforts to examine and find solutions to the unique food security issues in rural communities will help to achieve a more food secure region.

The *Food Security Assessment and Action Plan* (2007) indicated that transportation, in particular deficiencies in the transit system, arose as a key issue during the public consultation process.

Charitable food provision

There is general consensus among food policy groups and councils that food banks and short-term hunger relief programs are not part of a community food system in that they are indicators of food insecurity and would not exist in a food secure community. However, achieving community-level food security is seen as a continuum and, while communities may differ from where they are on that continuum, there will always be people who need to fall back on emergency food services.

Currently in the North Okanagan, food banks exist in Armstrong, Lumby and Vernon and there is a soup kitchen in Vernon. There are numerous other programs offering food for those in need and many schools have breakfast, lunch and/or snack programs.

The Food Security Assessment and Action Plan Report

As mentioned earlier in this report, the *Food Security Assessment and Action Plan* was completed for the North Okanagan region in 2007 (Nyberg-Smith 2007). Using statistical information, as well as anecdotal information gathered from extensive stakeholder and community consultation, the assessment provided detailed information on the issues related to food security in the region, while providing strategies and actions that would result in greater food security for the residents of the area. The report included an Action Plan, which set the following priorities as next steps:

- secure current community food programs
- enhance consumer awareness
- work with charitable food providers, local food producers, local government and the school district to develop local food access
- develop charitable food recovery strategies and policies to ensure a higher proportion of fresh and healthy foods to charitable food recipients
- explore food system planning

The North Okanagan Food Action Coalition was able to hire a part-time coordinator to begin implementation of the top priorities mentioned above. The initiatives currently underway or completed are outlined below.

The North Okanagan Food Action Society was formed to act as an umbrella organization for community food programs such as the Good Food Box, Community Gardens, Gleaning and other food system initiatives as resources permit.

Charitable food recovery efforts focussed on ways to provide a higher proportion of fresh and healthy foods to recipients of charitable food. Provision was made for representatives from the Salvation Army Food Bank and the Upper Room Mission to attend the Kamloops Food Share conference to learn how to develop a food recovery program locally. With community support, the Upper Room Mission is in the process of acquiring a refrigerated van, which will enable them to recover a higher proportion of fresh foods. The intent is that a program will eventually be developed that will allow this recovered food to be shared among organizations. Retail store policies dictate that donations of perishable food must be transported in controlled temperature conditions. Support for this project will not only recover a higher proportion of healthy foods for people in need but will have the added benefit of diverting waste from the landfill.

Local food producers gathered to explore possible systems to increase the availability of local food beyond the farmers' markets, as well as consider market mechanisms to make extending the growing season financially viable. Discussion revolved around a co-operative style box program with central distribution.

Input to the School District #22 Healthy Living Policy was provided during the District's review process. The District amended the policy in order to capture the new provincial guidelines for selling food and beverages. A number of policies were suggested to address food insecurity in schools and to find opportunities to link students to the local food system. Subsequently, Vernon Secondary School received a grant to develop a "farm to school salad bar" in their cafeteria.

Eat Local 101, a newspaper column to raise community awareness on the issues and benefits of eating locally ran from May to September 2008 in the local Morning Star newspaper.

Food policy and planning recommendations were presented to the City of Vernon. Following the presentation of the findings from the *Food Security Assessment and Action Plan* to the City of Vernon, the Council agreed to support food security, in principle, and to incorporate relevant elements into the new Official Community Plan (e.g., community gardens and an Agricultural Area Plan). The Council also resolved to consider adopting a community Food Charter and to support Food System Planning in the Regional Growth Strategy. City of Vernon provided, through a community grant, funding for the development of a food charter and food policies. This is currently under development and is intended to be presented to Vernon City Council early in 2009.

A Community/School Garden was established as a pilot project in the East Hill/BX area in 2008, with a three year lease between the private landowner and the Regional District of the North Okanagan. The bulk of the administration, site preparation and maintenance are the responsibility of a volunteer committee. Expanded registrations are expected to be fully subscribed by April 2009. The amount of community support for this project indicates that, as a pilot project, it has been very successful. Additionally, the City of Vernon supported a community grant for developing a community garden network plan.

In addition to the many successes mentioned above, there are several initiatives currently completed or in progress in the region that contribute to improved food security, including the following:

- City of Vernon's newly adopted Official Community Plan (2008) is based on Smart Growth principles, which includes an emphasis on creating complete, compact communities. The OCP also emphasizes the vision of the community for increased access to alternative transportation.

- The City of Vernon has created an Affordable Housing Committee, which is tasked with implementing the city's Attainable Housing Strategy (Neilson-Welch 2007).

- The Partners in Action Committee continues to make great progress in implementing its Homelessness Strategy (Social Planning Council of the North Okanagan 2007). With a goal of securing 200 non-market housing units over the next 3 years, the Committee continues to collaborate with non-profit agencies, government officials, B.C. Housing and the business community.

- The Regional District of the North Okanagan (GVAC) has received funding from the Union of B.C. Municipalities to complete a Healthy Food and Beverage Sales initiative in public buildings (http://www.bcrpa.bc.ca/HealthyFoodandBeverageSales.htm).

- Agricultural Area plans have been or are being developed for several North Okanagan communities including Spallumcheen, Coldstream (in process) and the City of Vernon (pending).

- The Regional District of the North Okanagan has established agriculture and the food system as a key growth issue to be considered in the Regional Growth Strategy process.

- The City of Armstrong has received funding through the Union of B.C. Municipalities Community Health Promotion grant to implement a community garden and explore food security and food systems planning (http://www.civicnet.bc.ca/siteengine/activepage.asp?PageID=244).

Recommendations

Opportunities to further improve food security in the North Okanagan include the following:

- Expand affordable/attainable housing strategies to include all regional communities, where possible.
- Encourage municipalities within the North Okanagan to adopt policies that provide for garden and food storage space and/or edible landscaping in new or renovated higher density residences.
- Ensure all jurisdictions develop land use plans that consider transportation and community design in relation to food access.
- Consider provision for community gardens, smaller farmer "pocket" markets, and edible landscaping in neighbourhood and park development and design – particularly where access is already limited.
- Assist with providing space, infrastructure, municipal resources to allow for a *regional* community garden network.

2.2.2 Food Literacy

Food literacy is a general term used to describe the knowledge and skill-building abilities needed to provide capacity within households to enable more food self-reliance, food security, and to facilitate a fresher, more local diet. It includes an understanding of healthy eating and nutrition, as well as the various skills needed to obtain, cook, and preserve the food. Food literacy includes understanding nutrition labels and choosing appropriate foods for particular needs.

In order to engage consumers in a regional food system and develop the skills, knowledge, and the important relationships that must be fostered to develop a new culture of local and healthy food supporters, we need aware and committed consumers. Building food literacy among eaters is vital to a sustainable regional food system. Equally important, is that these resources must be made as easy and as available as possible, reaching across a broad array of community members, including young children and students.

Outlined below are a number of ways in which a region can increase the food literacy of its citizens.

Community Food Programs

Community Food Programs provide many of the knowledge and skill-based opportunities that will benefit individual and community level food security, self-reliance and consumer food literacy in North Okanagan communities. These programs include:

- Community gardens
- Good Food Box - allows people to buy fresh fruits and vegetables for less than retail. This program sources local food when in season and provides recipes and storage and handling tips each month
- Community Kitchens - participants learn new economical recipes and take home food they have prepared as a group
- Gleaning

While many community food programs have been or are currently operating in the RDNO, the region lacks consistent funding or consistency in programs offered across the region, even though there is need and interest in having them available. However, there is a newly formed *Food Action Society of the North Okanagan*, which serves to umbrella the community food programs of the region. The programs currently available include the following:

- One allotment Community/School Garden operating in Greater Vernon.
- A Community Garden Network Development Plan is underway.
- Community gardens in Armstrong and Lumby are in the planning stages.
- The Good Food Box program serves an average of 350 people monthly in all North Okanagan communities.
- Community Kitchens programs are offered in Vernon, Lumby, Armstrong and Enderby and one is pending in Cherryville.

There is no formal Gleaning program at this time. However, the North Okanagan Valley Gleaners Society is hoping to set up a dehydrating plant in the District of Coldstream. The Society is waiting for ALC approval and the purchase of the site (previously a ginseng plant). The application to subdivide 5 acres from a larger site will be brought to the RDNO Board in early 2009 and, if approved, sent to the Agricultural Land Commission for approval (www.novgleaners.org).

Knowledge of Seasonal Variation

It is important for consumers to understand the seasonal variations and availability of the regionally produced food if they are to develop a more regional diet (i.e., they need to know that asparagus is available only for a short time in May or that raspberries peak in July). Fresh Food or Eat Local guides can provide this information.

Knowledge of Food Preservation

By purchasing or growing larger volumes, consumers have the opportunity to dehydrate, can, freeze, pickle or salt a number and variety of food products (as long as they are confident in their knowledge of food preservation, and have the time, means, implements, and capacity to store it).

Knowledge of Cooking with Fresh Foods

In order to move back to a more regional diet, many consumers must learn (or re-learn) how to cook from "scratch". At first it may seem like a hard-sell to get consumers to spend more time and effort cooking. However, the often superior taste of fresh, seasonal or home preserved foods, plus the conviviality that can come with sharing the process of cooking and eating, offers enticing benefits to this "slow food" method of meal-making.

Knowledge of Food Production

Whether it is a backyard kitchen garden, community allotment garden, fruit tree, or a small acreage with the potential to raise a cow and a few hens, consumers will be at an advantage if they are able develop their food producing skills. Strategies that encourage and enable consumers to produce their own food will improve personal food security and self-reliance. They will also provide opportunities for citizens to learn the seasonal cooking and preservation skills that are needed to develop a more regional diet.

There are also other benefits - it provides exercise and connects consumers with their environment (making it more likely that they will become better stewards of the land and water). It builds a sense of accomplishment and appreciation for the work of producing food, which, in turn, helps to create a regional and community food culture.

Initiatives that Improve Food Literacy

Case Study 1

The *FOOD for Lane County Gardens Program* in Oregon provides "a multi-faceted approach to reduce hunger and fulfill the basic need for nutritious food", including:

- opportunities for limited-income adults to work with others to grow food for themselves and the food bank
- education, job training and mentoring of limited-income and at-risk youth
- the creation and distribution of healthy, nutritious emergency and supplemental food to Lane County families, individuals and children (http://foodforlanecounty.org/Programs/Gardens/index.html).

Case Study 2

Growing Power, Inc won the 2005 Leadership for a Changing World Award from the Ford Foundation. Multi-faceted in its approach, their programs provide important opportunities for individuals and communities to collaborate in the promotion of food security and environmentally sound food production practices (http://www.growingpower.org/about_us.htm).

Growing Power, Inc, produces food in the organization's demonstration greenhouses, its rural farm site in Merton, and urban farms in Milwaukee and Chicago. Produce, grass-based meats, and value-added products from over 300 small family farmers are distributed through a farmer's cooperative. The organization also runs a year-round food security program. In addition, growing methods are demonstrated through on-site workshops on farms in Wisconsin and Chicago, Illinois and satellite training sites in several other states. The organization also provides outreach services locally, nationally and internationally for farmers and communities, provides youth programs and works on policy initiatives.

Case Study 3

A B.C. example of an opportunity for many people in an urban environment to learn about food production is found at the UBC Campus in Vancouver. The UBC Farm is a 24 hectare learning and research farm. As the only working farm within the city of Vancouver, the UBC Farm is a unique, urban agrarian gem.

"The Farm is a student-driven initiative where students, faculty, staff, and the local community have been working together to create a place where anyone can come to learn, live and value the connection between land, food and community. The ultimate goal of the farm is to retain and re-create existing farm and forest lands at the University of British Columbia into an internationally significant centre for sustainable agriculture, forestry and food systems" (http://www.landfood.ubc.ca/ubcfarm/about.php).

Recommendations

The following are recommended for improving food literacy in the region:

- Complete an assessment of unused or underutilized spaces or facilities in terms of their use for food programs, composting, gardening, etc.
- Create and implement educational programs on organic food production and food preservation.
- Provide neighbourhood schools with more school/community gardening opportunities.
- Determine the current state of, and ways to enhance, the integration of food system information into school curriculum.
- Improve food literacy in media communications.
- Establish a 'library' of food literacy resources, possibly web-based.

2.2.3 Consumer Engagement

Consumer engagement in the regional food system is about building relationships between consumers and producers, increasing awareness of each other's issues and providing consumers with the tools and resources they need to easily access local food.

A supporter of the 'local food' movement in the region had the following to say:

> *"We really have three types of consumers – the ones who are already convinced that supporting a locally sourced diet is important and are doing everything they can to eat regionally, the ones who are onside, but aren't going to make twenty trips around the region to get it, or don't know where to get it, and those who are just not there yet. Either way, if you can't get to the farmer's market, if the products are too inconvenient or difficult to access, you aren't going have the full engagement of your consumer. We need to find ways to make it an easier choice."*

There are many ways in which consumer engagement in the food system can be improved. Face to face transactions over food help to build relationships between consumers and producers. Every face to face food

transaction is about developing a trusted and comfortable relationship with the grower or producer. To reunite consumers with the producers is to reunite people with the regional food system.

Resources such as local food directories, which improve access and sourcing of local foods, can improve consumer engagement in the regional food system. They are particularly relevant after the growing season and Farmer's Markets have finished up for the year. Several communities in B.C. have found Farm Fresh Guides to be very effective tools for raising awareness of local foods, including southern Vancouver Island, Comox Valley, the Fraser Valley (http://www.bcfarmfresh.com/), Salmon Arm and Kamloops.

Improving the availability of local foods in regional, retail and food service outlets and restaurants is an extremely effective way of raising awareness of local foods and strengthening the regional food system. In order to facilitate more local food availability, it is vital to build networks and relationships among producers, suppliers and consumers. Consumers can help build confidence in this sector by requesting, and then purchasing, local products.

Any type of event that focuses on local food is an effective way to increase awareness around the benefits of local foods (and possibly the issues surrounding their production).

Connecting students with their food source will go a long way towards creating a regional food culture, while also encouraging healthier eating habits, and possibly generating an interest in some to pursue a food-related career. School health policies are emerging as important frameworks for creating a healthier food environment, as well as encouraging students to become involved in their own food system. There are a number of resources available to schools, and within the School District #22, there are initiatives and policies designed to not only provide healthier choices at school, but to also encourage schools to grow their own food in a school or community garden, or source it from local farmers.

Seed-Saver groups are sprouting up in several communities. They offer opportunities for people to learn, share and preserve their heritage varieties. *Seeds of Diversity* (http://www.seeds.ca/ev/events.php) is a website that provides information on events for people who are "interested in plant biodiversity, heritage gardening, organic gardening, and seeds. Many "Seedy Saturday" events take place throughout B.C. every year, each providing an opportunity for to learn about, share seeds and preserve heritage varieties. Maintaining a seed bank of heritage and open pollinated food plants is an important aspect of maintaining a resilient food system.

Consumer Engagement in the North Okanagan

The following highlights some of the initiatives currently in place in the North Okanagan related to consumer engagement in the food system:

- There are two Farmer's Markets in Vernon, one in Armstrong, one in Enderby and one in Lumby. The City of Vernon has expressed an interest in finding a location for a permanent farmer's market.
- Many farms in the region provide U-pick opportunities and farm-gate sales.
- The North Okanagan Organic Association website, which provides a membership list (http://www.certifiedorganic.bc.ca/index.htm).
- Agri-tourism destinations and a seasonal food guide have been published in local tourism/map books.

- The Food Action Society of the North Okanagan plans to feature educational and celebratory events that help to increase the public's understanding of food issues (e.g., showing of the documentary *Tableland*) and highlight locally produced food.

- The Okanagan Science Centre showcased an exhibit *Food for Health* from April to November 2008. In conjunction with the exhibit, the Centre hosted a series called *Farm Tales, Tall Tales and other Yarns*, which highlighted four speakers, who spoke on the history of agriculture in the region. The Science Centre also planted "The Three Sisters' Garden" just outside the entrance to the Centre and partnered with a local author to provide the story behind the companion garden.

- Initiatives involving students of School District #22 include:
    - Silver Star elementary is involved in the Greater Vernon Community Garden.
    - A *Farm to School Salad Bar* provincial initiative has begun at Vernon Secondary School as a pilot project. Salads featuring available locally produced foods are provided at an affordable price twice per week (http://www.phabc.org/modules.php?name=Farmtoschool).
    - School District #22 is working on a revision of their Healthy Living Policy (2008) to include the new provincial guidelines for the sale of foods and beverages as well as to improve student connections to the local food system and food security awareness.
    - Clarence Fulton Secondary is developing a cafeteria garden, greenhouse, and plans to involve the neighborhood in this initiative.
    - Silver Star Elementary School and Seaton Secondary School took part in an Interior Health pilot project, *School Food and Nutrition Policy Project* in 2003-2004. As a result, both schools showed improvement in their overall access to healthy foods (Nyberg-Smith 2007).
    - Many local schools have become participants in the *B.C. Fruit and Vegetable Nutritional Snack Program*, which delivers B.C. grown fruits and vegetables directly to the school and provides resources to teach students about nutrition and locally grown produce while increasing their consumption of fruits and vegetables (http://www.aitc.ca/bc/snacks/).
- The University of British Columbia Okanagan has recently added two courses related to Food Systems.
- The City of Vernon supported a community grant for developing a Community Garden Network Plan, a Food Charter and food policies. This is intended to be completed in early 2009.
- The Sustainable Environment Network Society has hosted public forums on the importance of a more sustainable food system.
- There is an annual "Seedy Saturday" event in Enderby.
- In 2007, The Runaway Moon Theatre in Enderby organized a community arts project inspired by local food called "Food for Thought". Eight weekend sessions were held over two years and community participants were asked to make and eat dishes prepared with local food and also create a collaborative art piece inspired by a vegetable

(http://www.runawaymoon.org/newsletters/RMT%20-%20March%202007%20Newsletter%20-%20Viewable.pdf)

- *Food Skills for Families* is a new resource created by the B.C. Healthy Living Alliance and the Canadian Diabetes Association. It is a food skills program geared to the needs of vulnerable families. The program will build skills necessary for choosing and preparing healthy foods. Programming, promotion, venues and training for community-based facilitators ensure the program reaches those who need it most if offered by the program. There is currently a course being offered in Armstrong and a course will be offered in Kelowna in early 2009 (http://www.bchealthyliving.ca/node/103).

Initiatives that Improve Consumer Engagement

Case Study 1

An American national model for engaging youth "in personal and social change through sustainable agriculture" is known as *The Food Project* and is located in Massachusetts (http://www.thefoodproject.org/about/index.asp). The organization works with over one hundred teens and thousands of volunteers every year to farm 31 rural acres and several urban lots in Boston. Nearly a quarter of a million pounds of food are grown each season along with several value-added products. The Food Project also acts as resource centre for organizations and individuals. Through materials, youth training and professional development opportunities, the organization provides capacity building opportunities for organizations and educators.

Case Study 2

A new provincial initiative called *Eat BC!* represents a partnership between the Restaurant and Foodservices Association and the B.C. Agriculture Council with funding from the B.C. Ministry of Agriculture and Lands, the Investment Agriculture Foundation and other industry sponsors. The initiative encourages consumers to choose locally produced food and beverages. This project has demonstrated that there are benefits to both the consumers and the restaurateurs when B.C. food items are highlighted on the menu (http://bcrfa.com/Text/1153261860168-7508/uploadedFiles/1215640869268-0287.pdf).

Case Study 3

Meet Your Maker, is an event series organized by Get Local, Local Food First and the Green Table Network. It is modelled after the extremely successful 'Farmer-Chef Connection' event series in Oregon, which has grown to a network of over 250 producers and 150 buyers, who are collectively doing $19 million in annual business (www.getlocal.org).

Recommendations

Recommendations for ways in which consumer engagement in the regional food system can be enhanced include the following:

- Using surveys or public forums, target producers, suppliers and consumers to determine the reasons behind the lack of retail and restaurant opportunities to access local food.

- Work with local food outlets to help them market their use of regionally produced foods.

- Use downtown festivals, winter carnivals, pageants, seasonal celebrations to generate demand and exposure for local producers and value–added products.
- Create partnerships to organize regional food celebrations that bring community and visitors together to enjoy and learn about our regional food assets.
- Publish a comprehensive "farm-fresh" guide to help consumers, visitors, chefs, etc. to source regional foods (e.g., includes seasonal charts and recipes, mapping and charting of access points for U-Picks, CSAs, etc., preservation information, and community food program information).
- Determine the feasibility of moving the UBC Faculty of Land and Food Systems from the Vancouver campus to the Kelowna campus, or creating an additional faculty at UBC-O.

2.3 Resiliency

Resilience is defined as the ability to persist through continuous development in the face of change, and to innovate and transform into more desirable configurations. Planning for resilience in our food system is important because, at its most basic, food is a daily requirement. A resilient food system is one which can undergo change without altering its functionality. Resilience in the food system includes a capacity for self-organisation and the capacity to learn and adapt.

In a very real sense, resilience can be understood as the opposite of vulnerability. Rather than an approach to agriculture that focuses solely on increasing productive capacity, resilience thinking focuses on reducing risk by increasing the adaptive capacity of people and the ecosystems on which they depend.

Efforts to improve productivity and reduce vulnerability of small-scale farmers are only effective when they build on local knowledge, protect (or improve) soil and water resources, and sustain or even enhance diversity (of genetic resources and in approaches/farming techniques). Resilience is also about building trust and mutual reliance – people are better able to adapt to challenges when they have strong social networks and are able to include others in decision-making. These relationships are enhanced when the distance between farmers and markets is reduced, where learning engages local people with their neighbors, and where markets are encouraged at the local level (Food Security Policy Group 2008).

A system with increased biodiversity (i.e., several species and varieties of crops) is more adaptable to weather events, climate variability and change, and is more resistant to adverse effects of pests and diseases. At the same time increased biodiversity stabilizes yields over the long term. Biodiverse farms are endowed with nutrient-enriching plants, insect predators, pollinators, nitrogen-fixing and nitrogen-decomposing bacteria, and a variety of other organisms that perform various beneficial ecological functions (Altieri and Koohafkan 2008).

Building resilience in our food system requires a planning phase and a transition phase. The process usually begins with a window of opportunity brought about by community awareness and/or changing conditions. The *Food Security Assessment and Action Plan* (Nyberg-Smith 2007) was part of a growing community awareness that resulted from groundwork laid down by Interior Health staff, especially Donna Antonishak, over the past several years.

The planning phase is characterised by knowledge gathering and networking throughout a cross-section of participants in the food system. The North Okanagan is entering into this phase with the formation of the North

Okanagan Food Action Society and current work underway in the District of Coldstream on an Agricultural Area Plan. The City of Vernon will begin work on an Agricultural Area Plan in early 2009. Spallumcheen has already completed an Agriculture Area Plan.

Planning background and recommendations are contained in this plan but the encompassing transition into a more resilient food system will be the ongoing work of government agencies, individuals, businesses and community groups over the coming months and years. Navigating through the transition phase requires flexibility on the part of these various groups and agencies. Disturbances, surprises and set-backs at this stage are normal and actually serve to strengthen resilience through providing opportunities for innovation and renewal. Persistence and perseverance through the process are essential.

Many factors affect the resilience of the North Okanagan food system. The key components of resiliency included in this report are the managing of land and water resources so as to maintain or improve food self-reliance, the ability to adapt to climate change, and the incorporation of emergency preparedness on a regional basis, especially during the winter months when the region relies heavily on imports. By working to increase the resilience of the food system today, we can mitigate any future deleterious effects.

BC has 56 turkey producers who generated $41.9 million in turkey sales in 2007. BC imports less than 2% of the turkey produced here domestically.

The largest field vegetable crop in the province, BC produces 71,000 tonnes of potatoes annually. But we import 107,753 tonnes (worth over $59.3 million) each year, mostly from the US (Washington State and Idaho).

72% of BC's table potatoes are grown in the Fraser Valley.

While BC is a net importer of potatoes, we are a net exporter of seed potatoes. Known as "Spud Valley", the Pemberton Valley's rich volcanic soils enable it to produce the largest variety of seed potatoes in the world, providing potato farmers around the globe with BC seed potatoes.

Although BC produces approximately 3 million pounds of pumpkins annually, most of those are the large stock used for Hallowe'en jack-o-lanterns. Canada imports the vast majority of pumpkin used for human consumption.

Although Canada produces 78 tonnes of lettuce a year, we import 305 tonnes. Most of our imports come from the US, and predominantly California.

In 2001, 659 acres of BC farmland produced 6.1 million pounds of Brussells Sprouts, representing $2.4 million in farm gate receipts.

From: The Farmland Defense League

2.3.1 Food Self-Reliance

Food self reliance may also be referred to as food self-sufficiency. It is commonly considered to be the portion of food consumed in an area that is produced in that area and, as the population grows, the resources needed to maintain or expand the portion of food produced in that area. In the case of the North Okanagan, at 2% population growth per year, there is an underutilised land base whose productive capacity could be increased by 2%/year, as long as water resources are available.

The population in the North Okanagan has grown by 40% over the last twenty years and is projected to grow by 45-65% over the next twenty-five years (Statistics Canada 2006). The demand for food in the North Okanagan will experience a similar increase and, as a result, area planners are advised to include the food system in their sustainability considerations. Land use and water are the resources most closely linked to food self reliance that can be influenced by local planning initiatives.

Planning to maintain food self reliance, or transitioning to increase food self reliance, is important because of the growing public concern over food safety, world food shortages, and the ecological impact of the industrial agricultural industry and its food products.

B.C. as a whole is estimated to be roughly 50% self-reliant, based on agricultural production (not including fish and seafood). When compared to *Canada's Food Guide to Healthy Eating*, which recommends a higher consumption of dairy, fruit and vegetables and lower consumption of meat and grains than is currently consumed, B.C.'s self reliance falls to 34% (B.C. Ministry of Agriculture and Lands 2006).

The Regional District of the North Okanagan is completely self reliant for apples, chickens and milk production (but not for milk processing). The region is also self reliant for forage crops used for livestock production. The local grain industry is the most completely self reliant, diversified and integrated sector of local agriculture. It is well integrated within the region with flour milling, secondary food processing, and feed processing for the livestock industry.

The region has a mix of suitable land and the climatic conditions necessary to expand the production of fruit, vegetables and grains for human consumption and grains, forage crops and pasture for livestock operations. However, we are limited by winter temperatures and day length, which do not allow for year round fruit and vegetable production. Currently in this region, the costs of heating and lighting a commercial greenhouse production after October 30 would exceed any revenue generated by the operation. Other issues currently impacting the region's ability to sustain increased, economically viable, production are discussed in previous sections.

B.C.'s Food Self-Reliance report (B.C. Ministry of Agriculture and Lands 2006) estimates that, given the production technology available today, over half a hectare of farmland (0.524 ha, which is the equivalent to 1.3 acres) is needed to produce the food for one person for one year. In order to produce a healthy diet for British Columbians, farmers need 2.15 million hectares of food producing land of which 10% (215,000 hectares) needs to be irrigated. In 2005, the Ministry of Agriculture and Lands estimated that approximately 189,000 hectares of farmland had access to irrigation.

If we use the self-reliance report as a rough indicator, the current population in the North Okanagan Regional District (77,301) would require an estimated 40,505 hectares of food producing land to feed its current population. In 2006, the region had 76,624 hectares in production. The region's population is projected to grow by 45-65% over the next twenty-five years (Statistics Canada 2006). The demand for food in the North Okanagan will experience a similar increase (i.e., ~60,000 hectares).

This calculation does not take into account the capacity to grow food in urban areas (e.g., rooftop gardens). In his recent article, *The Role of Home Gardens in Feeding the World & Sequestering Carbon* (2009), Michael Pilarski argues that home gardens are far more productive than conventional systems of agriculture and that yards and un-used (and under-utilized) land in and around cities has the potential to produce a substantial proportion of food needs on areas currently not classified as agricultural acreage.

There are a number of estimates on the size of the garden needed to feed one person. The higher estimates are based on agriculture and acreage for meat production and the lower figures are based on home gardens. The estimates vary from 1/43 of an acre to 1/3 of acre (Pilarski 2009). Some of the variation can be accounted for differences in diet. For example, some vegetables such as potatoes and squash, produce high yields of carbohydrates on less land then grain (grains take 5 to 10 times as much land as potatoes to feed one person).

2.3.2 Climate Change

Climate change is considered by many scientists to be the most serious issue facing the world today. Increasing global average temperatures affect long term climatic patterns and contribute to associated weather disturbances. Disrupted climatic patterns can impact water resources, altering precipitation patterns and increasing the frequency and severity of storms, floods, wildfires and droughts.

A climate change impact potentially significant to small farm production is the loss of soil organic matter. Higher air temperatures are likely to speed up the breakdown of organic matter and to increase the rates of other soil processes that affect fertility. Under drier soil conditions, root growth and decomposition of organic matter are reduced. As soil cover is reduced, loss of soil due to wind erosion is increased, especially if winds intensify.

Most studies have concluded that insect pests will generally increase as temperatures increase. Migrant pests are expected to respond more quickly to climate change than plants, and may have a significant impact on crops.

Both formal and informal surveys with agricultural producers across Canada have indicated that drought and temperature increases cause the most difficulties with farming operations. The impacts of a lack of moisture and excessive heat are the most challenging to cope with, causing the most severe plant and animal-related difficulties. Climate change can exacerbate any current environmental problems in the agriculture sector and create additional problems (e.g., blue tongue disease in cattle is related to drought). More unknown problems may also emerge (e.g., more pests and diseases, invasive species) (C-CIARN 2007).

Climate change can be discussed relative to the regional food system from two perspectives:

- **Adapting** the regional food system in response to the anticipated positive and negative impacts of the changing regional climate
- **Mitigating** the contribution of greenhouse gas emissions to the atmosphere that contribute to climate change from the various components of the regional food system.

A more detailed and comprehensive analysis of the potential impact of climate change on climate variables and the subsequent impacts on agricultural production in the region, and the relationship between the food system and greenhouse gas emissions is provided in Appendix 2.

Potential Effects of Climate and Weather Variability on the North Okanagan Food System

Regional climate change effects on temperature and climate were explored using the ClimateBC program. This program does not provide information on the variability of climate variables expressed in the frequency of extreme weather events within the region or sustained weather changes as a result of El Nino and La Nina events. North Okanagan communities and the food system infrastructure have evolved within a pattern of local climate variability to which they have adapted. Extreme meteorological and hydrological events, especially droughts, storms and floods, can produce catastrophic failure of food system elements. A sustainable regional food system includes the capacity to withstand current and future meteorological and hydrological extremes and be resilient for rapid recovery following failure.

These events include:

- Summer storms associated with high levels of precipitation and/or hail affecting agricultural crops and/or damage to distribution network and agricultural infrastructure.
- Winter storm events and associated avalanches in the Southern Interior impacting key highway distribution networks.
- Sustained drought conditions with the potential catastrophic impact on perennial crops such as orchards and vineyards, as well as the associated increased wildfire hazard.
- Flooding of agricultural crops and infrastructure and distribution network associated with spring freshet.

In climate modelling for the North Okanagan, using the recently developed ClimateBC V 3.2 program, changes to mean annual temperatures suggest future increased climatic suitability for tree fruits and forage crops, but with an increased demand for irrigation water and a reduced winter snow pack. Spring rains are expected to be heavier with associated flooding concerns. Reduced summer water levels and increased temperatures are likely to diminish the recharge of groundwater, causing small streams to dry up and affecting wetlands and other wildlife habitat. In short, water will become a more precious resource requiring higher levels of management.

The Food System and Greenhouse Gas Emissions

A growing body of research is developing in the United States and Europe that uses "life-cycle" analyses of food types to ascertain GHG contributions. The studies trace back and accumulate the contribution of various forms of green houses gases from the consumer's plate, back through the retail, distribution and processing phases, finally reaching the producing farmers including the GHG contributions from farm practices and farm inputs.

It is anticipated that these types of studies will inform consumers and other decision makers on how shifts in consumer diets from certain food commodities to others can contribute to mitigating GHG emissions and reduce the emission "footprint" of households. These studies will also inform the relative importance of other consumer decisions associated with food, including the practice of using "food miles" as an indicator of GHG impacts.

Food production systems are both affected by and contribute to global warming, one measure of climate change. Carbon is one of the greenhouse gases that becomes trapped in our atmosphere and prevents heat from escaping the earth's surface. Carbon is sequestered by pasture and perennial forage crops, but is released by cultivation operations which turn the soil and leave it bare (often part of an effective, non-chemical weed control practice). Carbon is also a by-product of the transportation industry when food is shipped many miles from where it is grown to where it is consumed.

Data Gaps

There is still a substantial amount of uncertainty around what the impacts of climate change will mean for our regional food system. Decision-makers would benefit significantly from more detailed climate data, as outlined below.

Weather Stations

Additional weather stations are needed to improve the accuracy of decision making tools at both an operational and strategic level. Weather stations support the daily decision making of producers, particularly in making decisions associated with irrigation scheduling and quantities. The closer the farm is located to a weather station, the more accurate the information, particularly in the North Okanagan where the varied topography results in a variety of microclimates.

Also, the accuracy of climate change models is improved by additional weather stations. Currently within the North Okanagan Regional District, weather stations are operated by Environment Canada and through a public-private partnership administered by FarmWest.

Climate Change Modeling

More accurate climate change modeling of temperature and precipitation variables for the North Okanagan is needed to inform decision making associated with food production. The ClimateBC tool used for this report does not provide the data at a scale large enough to give accurate predictions for specific locations (e.g., Coldstream, Enderby). More accurate modeling would also support the development of specific regional mapping products associated with agricultural production such as the climate suitability for dryland farming of cereals, grape, silage corn, peach and other production.

An increased focus is needed on research and model development associated with the impacts of extreme climate and weather events on food system infrastructure and regional food producers. An improved understanding is needed of potential changes in wind regimes, and the intensity and distribution of invasive plants and animals, insects and diseases.

An improved understanding is needed of the impact of climate change on competing agricultural regions, and the impact of climate change on potential and existing external markets of North Okanagan producers and processors. Unlike the Okanagan Basin, there is no strategic level water and demand study proposed or initiated for the Shuswap Basin portion of the North Okanagan Regional District.

Current Local Initiatives and Supportive Policy

There are several initiatives underway in the Okanagan that will help our region to adapt to climate change and also to mitigate the impacts our food system has on greenhouse gas emissions, as outlined below.

The Okanagan Basin Water Supply and Demand study is currently underway. It is a major, multi-phase research partnership examining the water budget (the supply and demand) for the Okanagan Basin. A component of the study is predicting the future supply and demand of water under different climate change scenarios. This project applies best available science to the Okanagan Basin within the North Okanagan. The

project is strategic in scope and will identify information gaps that will need to be addressed in subsequent initiatives.

University of British Columbia – Okanagan and the Pacific AgriFood Research Centre in Kelowna and Summerland, respectively, are institutions with researchers who are actively involved in research partnerships associated with climate change adaption in the Okanagan.

The British Columbia Agriculture Plan is a long term strategic vision for the agricultural industry in British Columbia. A key component of the plan is providing strategic direction for the agricultural and food sector to mitigate climate change impacts (http://www.al.gov.bc.ca/Agriculture_Plan/index.html).

A manure anaerobic digestion facility is currently under development at a large dairy farm near Enderby. This facility will use bacteria in an anaerobic environment to produce methane from manure and animal waste from the farm and from other farms in the region. The methane produced will be used to generate electrical energy rather than escaping to the atmosphere. Electricity surplus to the farms needs will be sold into the province's electrical grid.

Environmental Farm Planning is a program delivered by the B.C. Agricultural Council and its member producer organizations. Environmental Farm Plans are developed by farmers and ranchers to support environmental sustainability of air, water and bio-diversity at the farm level.

Organic farming is supported in the Province by provisions that enable the marketing of certified organic products. There is growing demand for organic food at the regional, domestic and international level.

Other Initiatives

Crop insurance programs in British Columbia may need to be modified to reflect the increased variability of weather and climate in the province and the increased potential for agricultural pests and diseases resulting from climate change.

Extension programs are of increasing importance to producers and processors as a result of the increasing need for knowledge transfer from researchers to the farm operation. The Central Okanagan Regional District has engaged an Agricultural Development Officer to strengthen the local food system by providing extension services and fostering research partnerships.

The Province of B.C. and the Union of B.C. Municipalities and local governments signed a B.C. Climate Action Charter with the goal of becoming carbon neutral by 2012. One of the common goals is to encourage the planning for complete and compact communities and to encourage the provision of infrastructure that supports the economic and social needs of the community while minimizing its environmental impact. The North Okanagan Food System Plan is part of this planning process.

The Canadian Climate Impacts and Adaptation Research Network (C-CIARN) is a network established in 2001 and funded by Natural Resources Canada (NRCan). It links researchers with stakeholders to identify key issues that need to be addressed if we are to successfully adapt to our future climate and increase Canada's resilience to climate variability and change. The network brings voice and visibility to climate change impacts and adaptation issues, and has hosted hundreds of workshops. CCIARN is comprised of six regions and six sectors. Two of these sectors include the agricultural sector and the water resources sector. For six years C-CIARN has been working to identify climate change adaptation issues and knowledge gaps (C-CIARN 2007).

Recommendations

In addition to the need to fill the data gaps that have been described above, it is recommended that a study is conducted to investigate the potential for creating and implementing a reward system for agricultural practises which increase carbon sequestration.

2.3.3 Emergency Preparedness

Emergency preparedness is important for protecting lives, reducing suffering, protecting property, mitigating damage to the environment and for controlling economic consequences in the case of emergencies and disasters.

In the wintertime, most of the regional food supplies come from elsewhere, with an average household food supply of 2-3 days and an additional 3-4 days of food supply in the retail grocery system. The strengthening of a regional food system plays an integral part in emergency preparedness by reducing the reliance on outside food sources.

The Province of B.C. has a Provincial Emergency Program that prepares and updates multi-agency hazard plans. The plans foster cooperation among multiple organizations. Local governments lead the initial response to emergencies and disasters in the community. The City of Vernon has partnered with the District of Coldstream to implement an Emergency Response and Recovery Plan for the Vernon/Coldstream boundaries. One component of the plan is to encourage each household to maintain a supply of food and water sufficient for 72 hours and the means to prepare meals, if the power is out. Households that are food secure with adequate supplies and storage facilities will reduce the burden of emergency services.

Emergency response planning for all scales of water systems to protect the delivery of safe drinking water is integrated with local emergency response organizations, regulatory authorities and local government officials. Best practises for emergency response planning are available through the B.C. Water and Waste Association.

Recommendations

To improve our ability to respond to emergencies, as related to the food system, it is recommended that the region:

- Develop local food procurement policies for emergency preparedness plans.
- Encourage the provision of food storage space in new housing construction.
- Encourage 72 hour household preparedness in all jurisdictions.
- Provide workshops on seed saving.

3. Next Steps

This document is a beginning foundation from which citizens, community groups, government, the business community, and the agricultural sector can continue the work of strengthening our regional food system and increase its resiliency. The forging of dynamic, collaborative relationships and partnerships will be critical to the success of the implementation of the recommendations that come from this plan.

We are fortunate in the region to already have many agencies, community groups and local governments engaged in food system initiatives and planning. The North Okanagan Food Action Coalition, for example, is comprised of a group of professionals and volunteers representing health, nutrition, agriculture, food producers, social service agencies, food programs and municipal councilors and staff.

Upon completion of this report, one or more public forums will be held in the region. This will allow the presentation of the report to all that are interested in engaging in the process of strengthening our food system (i.e., citizens, community groups, government, the business community, and the agricultural sector). Following the presentation of the report, those attending the forum(s) will be asked to assist in the creation of an Action Plan. To achieve this, we will need to identify our current capacity in the region, potential partnerships, and priority actions (with timelines attached). The recommendations in this report will form the basis for the discussions on priority actions.

In addition, this report will be used as a reference document for consideration within the Regional Growth Strategy policy development process. In particular, this document will be used as the primary reference for the Agriculture and Food Systems Working Group, and will inform other working groups exploring issues related to economic development, water stewardship, social concerns, transportation, and natural lands.

The creation of a Regional Food Policy Council is likely key to the successful implementation of the strategies that stem from this Plan. It is recommended that consideration be given to the creation of a contract position of a Food System Planner. This position would provide consistent support to a largely volunteer Regional Food Policy Council and could also provide support to jurisdictions in the region that have (or are working towards) Agricultural Area Plans.

4 Glossary

Access is defined as having the right, opportunity or ability to reach, enter or use a facility, program, service of materials; visit a person or people; and/or receive, understand and use information, knowledge or skills (*adapted from The City of Toronto Task Force on Community Access & Equity, Glossary of Access and Equity Terms 1998-1999*)

Advocacy is the act of supporting or arguing in favour of a cause, policy or idea. It is undertaken to influence public opinion and societal attitudes or to bring about changes in government, community or institutional policies (*adapted from the Kidney Foundation of Canada Advocacy Handbook*)

Community usually refers to a geographic location – a place where a group of individuals reside and are subject to the same laws. Community can also refer to a group of individuals with common characteristics, beliefs, values or interests (e.g. a faith-based community). As well, communities can be composed of individuals sharing a range of common needs or experiences. What is crucial to any "community" however, is the sense of belonging or attachment that individuals have with one another and/or their environment. (*adapted from The City of Toronto Task Force on Community Access & Equity, Glossary of Access and Equity Terms 1998-1999*)

Community development is a process designed to create conditions of economic and social progress for the whole community with its active participation and fullest possible reliance upon the community's initiative. (*United Nations: 1948*)

Community food security is a situation in which all community residents obtain a safe, culturally acceptable, nutritionally adequate diet through a sustainable food system that maximises self-reliance and social justice. (Hamm and Bellows, 2003). Food security also includes being able to make a living by growing and producing food in ways that protect and support both the land, seas and the food producers, and that ensure that there will be healthy food for our children's children. (*Food Security Projects of the Nova Scotia Nutrition Council and the Atlantic Health Promotion Research Centre, Dalhousie University*)

Determinants of health are the range of personal, social, economic and environmental factors that determine the health status of individuals or populations. (Word Health Organisation Health Promotion Glossary, 1999). Specifically, the social determinants of health arise from historical, social, cultural, economic and political circumstances that produce inequalities of health in populations. (Dietitians of Canada)

Ecosystem is an integrated and stable association of living resources (plant, animal and micro-organisms) and non-living resources functioning within a defined physical location. (*Environment Canada, International Relations Glossary*)

Fair trade is a trading partnership based on dialogue, transparency and respect that seeks greater equity in international trade. It contributes to sustainable development by offering better trading conditions to and securing the rights of marginalized producers and workers, particularly in the Developing World (*adapted from the International Federation for Alternative Trade*)

Food bank is a broad term for an organization or entity that acquires, stores and distributes food to the needy in their community. Food banks are typically supported by community food drives and umbrella organisations, as well as grocery stores, local agriculture, food processors and distributors. (*Ontario Association of Food Banks)*

Food security – see **Community food security**

Food insecurity is the opposite of food security. Food insecurity refers to limited or uncertain access to nutritious, safe foods, necessary to lead a healthy lifestyle; households that experience food insecurity have reduced quality or variety of meals and may have irregular food intake. *(United States Department of Agriculture, Life Research Office)*

Food safety refers to the concept of food being free from all hazards, whether chronic or acute, that make food injurious to the health of the consumer. (*World Health Organisation)*

Food system is a term used to describe the components of production, distribution, processing, consumption and waste and the interactions between these elements. (*Oakland Food System Assessment*)

Global food system is a system dominated by a small number of agri-food businesses, that links national and local food systems from around the world. (*adapted from The Global Food System: A Research Agenda* and *Towards a Sustainable Global Food System: What Will it Take?)*

Greenhouse gases are gases in the atmosphere that trap the sun's energy and thereby contribute to rising surface temperatures. The main greenhouse gas that contributes to climate change is carbon dioxide (CO_2), a by-product of burning fossil fuels. Other greenhouse gases include methane (from agricultural sources) and nitrous oxide (from industrial sources). (*Environment Canada, International Relations Glossary*)

Health is a state of complete physical, social and mental well-being, and not merely the absence of disease or infirmity. Health is a resource for everyday life, not the object of living. It is a positive concept emphasising social and personal resources as well as physical capabilities (*World Health Organisation*)

Poverty is a state of being without adequate food, shelter or other basic necessities of life. In economic terms, there are two kinds of poverty; absolute and relative. Absolute poverty is a defined standard that has been agreed upon by experts and many countries and is further classified as extreme (individuals living on less than one dollar a day), or moderate (individuals living on between one and two dollars a day). Relative poverty is dependent on the county or region as well as the social context. (*adapted from the Ontario Association of Food Banks)*

Social justice is a concept based upon the belief that each individual and group within a given society has a right to civil liberties, equal opportunity, fairness and participation in the educational, economic, institutional, social and moral freedoms and responsibilities valued by the community. (*R. Degan and Dr. M. Disman in "Cultural Competency Handbook" Department of Public Health Sciences, University of Toronto)*

Sustainable agriculture is a method of farming that provides a secure living for farm families; maintains the natural environment and resources; supports the rural community; and offers respect and fair treatment to all involved, from farm workers to consumers to the animals raised for food. Sustainable agriculture meets the needs of the current generation while conserving resources for the use of future generations. (*Sustainable Table, www.bctheorganicway.com/glossary.htm)*

5 References

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Appendix 1. Kaslo Food Charter

In 1976, Canada signed the United Nations Covenant on Social, Economic and Cultural Rights, which includes "the fundamental right of everyone to be free from hunger." Food security is defined as :when all people, at all times, have access to nutritious, safe, personally acceptable and culturally appropriate foods, produced in ways that are environmentally sound and socially just. The Village of Kaslo supports our national commitment to food security, and the following values:

- Every Kaslo resident should have access to an adequate supply of nutritious, affordable and culturally-appropriate food.
- Food security contributes to the health and well-being of residents while reducing their need for medical care.
- Food is central to Kaslo's economy, and the commitment to food security can strengthen the food sector's growth and development.
- Food brings people together in celebrations of community and diversity and is an important part of the village's culture.
- A healthy foodshed in Kaslo relies on an amalgamated North Kootenay Lake food system

Therefore, to promote food security, Kaslo Village Council may:

1. Champion the importance of food security to federal, provincial and regional government partners.

2. Champion the right of all residents to have access to adequate amounts of safe, and nutritious, food without the need to resort to emergency food providers and advocate for policies that support the secure and dignified access to the food people need

3. Sponsor nutrition programs and services that promote healthy growth in children and help prevent diet-related diseases in later life

4. Partner with local producers, community, cooperative, business and government organizations to increase the availability of healthy local foods

5. Support events that highlight the region's diverse food shed

6. Promote food safety programs and services.

7. Foster a civic culture that inspires all Kaslo residents and all village departments to support local food producers and food programs that provide cultural, social, economic and health benefits by adopting food purchasing practices for Village sponsored events that serve as a model of health, social and environmental responsibility

8. Plant Village decorative gardens with food producing species that are maintained and managed to promote the conservation of wildlife.

9. Encourage the use of our community garden to increase food self-reliance, improve fitness, contribute to a cleaner environment, and enhance community development

10. Advocate for the protection of local producers, agricultural lands and support agriculture through initiatives that highlight the importance of our farmers by working towards an equitable economy that values food producers and the land they grow food on

11. Consider accepting applications for Village owned land to be leased for food production.

12. Support and implement the separation of organic materials from the waste system to be recycled and be made available to nurture soil fertility while reducing compost and foodstuffs garbage that attract bears

13. Foster policies that encourage and assist Village residents to produce their own food in their gardens.

14. Recognize that water is an intricate and essential element to a healthy community and advocate for responsible use

15. Work with community agencies, residents' groups, businesses and other levels of government to achieve these goals.

Definitions in Charter culturally appropriate food: refers to essential nutrients within specific cultural diets. Ie: foodstuffs of the native inhabitants of the region; Ktunaxa & Sinixt
local producers: refers to anyone whom is producing foodstuffs as a way of supporting their household whether financially with commercial foodstuffs or as a homestead and backyard gardeners

Appendix 2. Climate Change and Agriculture

Background/Profile

Climate change can be discussed relative to the regional food system from two perspectives:

- **Adapting** the regional food system in response to the anticipated positive and negative impacts of the changing regional climate
- **Mitigating** the contribution of green house gas emissions to the atmosphere that contribute to climate change from the various components of the regional food system.

This appendix discusses both perspectives of food system – climate change inter-relationships

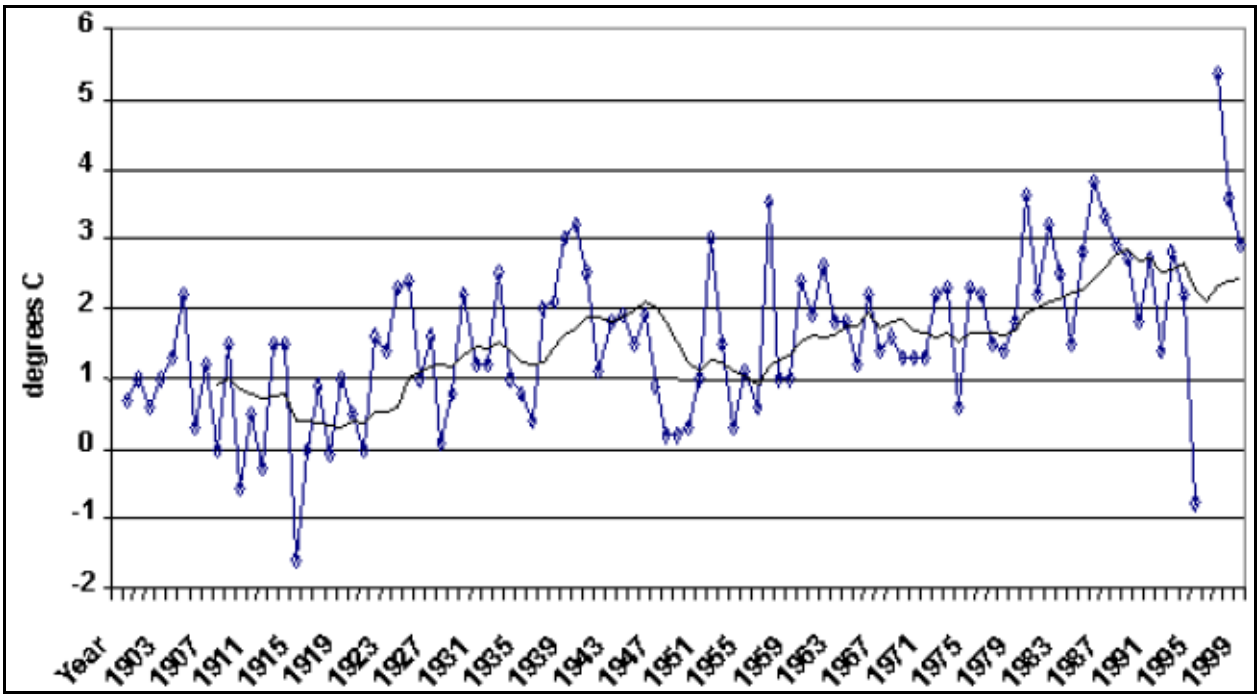
Part 1 - Adapting to Climate Change

The climate of the planet is changing and the global food system throughout the planet is affected in both positive and negative ways. Adapting to climate change is a challenge facing all regional food systems. In the competitive agricultural economy, anticipating climate change impacts and adapting faster than competitors will become a significant advantage.

Climate change is resulting in changes to temperatures, the amount and timing of precipitation, the increased variability of weather, and sea level rise. These changes will increasingly result in agricultural production increasing in some areas, decreasing in others, and an increased frequency in catastrophic events affecting the global food system such as droughts and storms. Globally, changes to food production systems will have dramatic impacts on broader economic systems. Food system changes will have broad political implications.

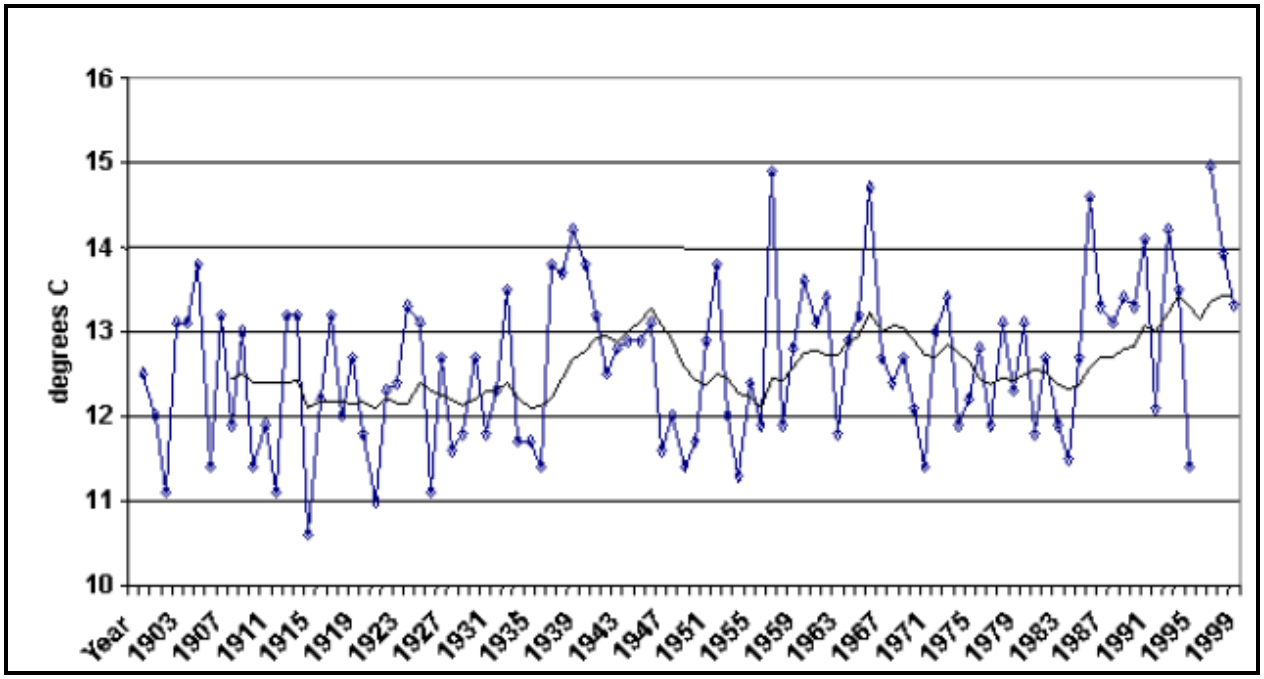
Agricultural areas in high latitudes, such as the North Okanagan, will be affected most by climate change. The North Okanagan food system is a component of the global food system and will increasingly be impacted directly and indirectly by climate change. Some areas within the region will increase agricultural production, others will decrease; there will be changes affecting local food processors, and the supply and cost of food imported from outside the region to serve local consumers will be affected.

An indication of how the climate of the North Okanagan is becoming warmer is shown in the two graphs below based on a century of weather measurements at Coldstream Ranch. The graphs also show the increasing variability in the climate over the century. The following graph is based on the average minimum temperature for each calendar year.



Trend in Minimum Temperature at Coldstream Ranch

A similar warming trend is also revealed in the average maximum temperature for each calendar year.



Trend in Maximum Temperature at Coldstream Ranch

Agricultural systems in the North Okanagan will be affected by climate changes associated with temperature and precipitation as well as by climate and weather variability.

The following maps are derived from historic climate data associated with temperature and precipitation between 1961 and 1990 and predictive climate data using the ClimateBC v 3.2 program[i] jointly developed by the provincial government and UBC scientists. The program allows for a number of different climate variables pertinent to agricultural production to be calculated or derived for a geographical area. The program also provides for the production of climate variables based on future climate data sets generated by various global circulation models and climate change scenarios.

Four sets of maps produced by the Climate BC program follow, each reflecting the regional distribution of a climate variable important to North Okanagan agriculture – Mean Annual Temperature, Number of Frost Free Days, Summer Precipitation and Precipitation as Snow. Each group of maps contains a map showing the climate variable based on historical data (1961-1990 Normals) and two maps of predicted climate data based on two climate change scenarios – A1F1 and B2 being applied to the Canadian Global Circulation Model 2 (CGCM2). The two predictive maps reflect the average of the climate variable for the period 2050 to 2060.

The two future climate change scenarios are based on the following assumptions[ii]:

	Climate Scenario A1F1	**Climate Scenario B2**
World	• Market-orientated	• Local solutions
Economy	• Rapid per capita growth	• Intermediate Growth
Population	• 2050 peak, then decline	• Continuously increasing
Governance	• Strong regional interactions – capacity building, income convergence of regions	• Local solutions to social, economic and environmental sustainability
Technology	• Rapid introduction of new and more efficient technologies • Fossil energy intensive	• Less rapid introduction of new and more efficient technologies • Diverse energy technology (fossil fuels, clean and resource-efficient)

CLIMATE CHANGE TERMINOLOGY

"Climate is what you expect, weather is what you get"

WEATHER describes atmospheric conditions at a particular place in terms of air temperature, pressure, humidity, wind speed, and precipitation.

CLIMATE is often defined as the weather averaged over time (typically, 30 years).

CLIMATE VARIABILITY refers to variations in the mean state of climate on all temporal and spatial scales beyond that of individual weather events. Examples of climate variability include extended droughts, floods, and conditions that result from periodic El Niño and La Niña events.

CLIMATE CHANGE refers to shifts in the mean state of the climate or in its variability, persisting for an extended period (decades or longer). Climate change may be due to natural changes or to persistent anthropogenic changes in the composition of the atmosphere or in land use.

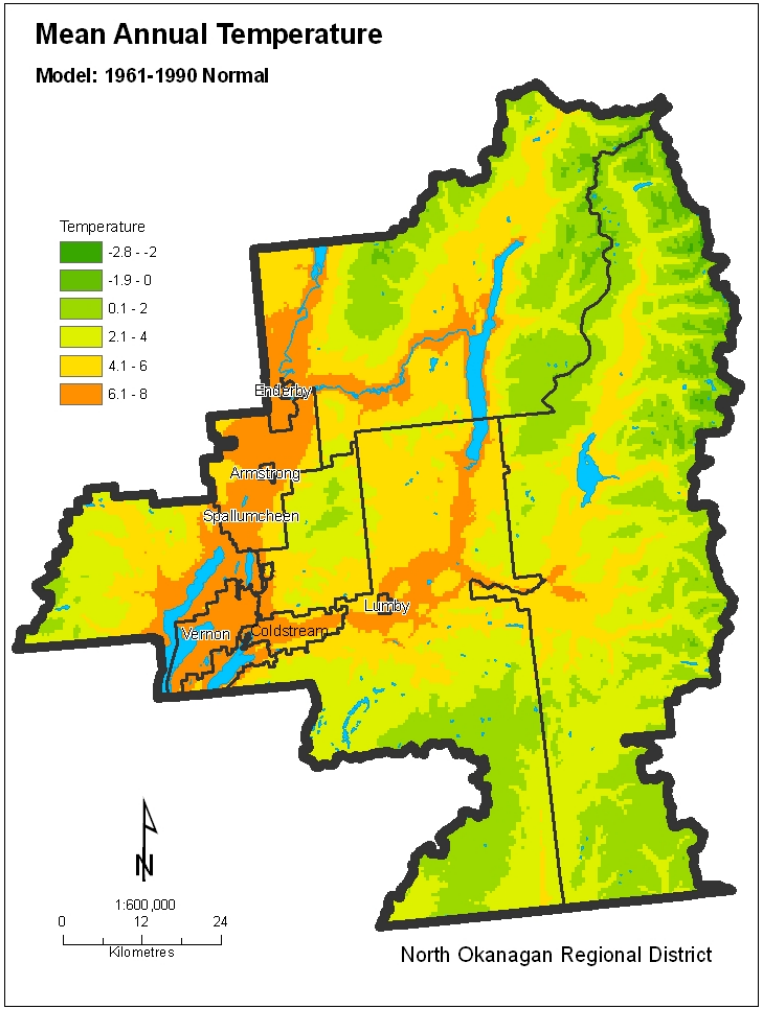
VULNERABILITY to the impacts of climate change is a function of exposure to climate conditions, sensitivity to those conditions, and the capacity to adapt to the changes.

ADAPTATIONS are actions taken to help communities and ecosystems moderate, cope with, or take advantage of actual or expected changes in climate conditions.

Definitions are based on IPCC Climate Change 2001 and 2007 Impacts, Adaptation and Vulnerability reports as well as OECD's report, "Bridge Over Troubled Waters" and an article prepared by OECD staff, Levina and Tirpak.

The following maps are derived by displaying the data generated by the ClimateBC program in a Geographical Information System or GIS. The data is generated to create a 400 metre grid. This information can be displayed and interpreted broadly at a regional scale but caution should be exercised when interpreting the maps for small specific areas such as a farm or community.

When interpreting the maps from an agricultural production perspective, it is important to note that soil types and topography are significant factors that affect the agricultural potential of land. These factors are not reflected in the maps



Historical Records 1961 - 1990

Potential Impact

of Climate Change on Climate Variables and

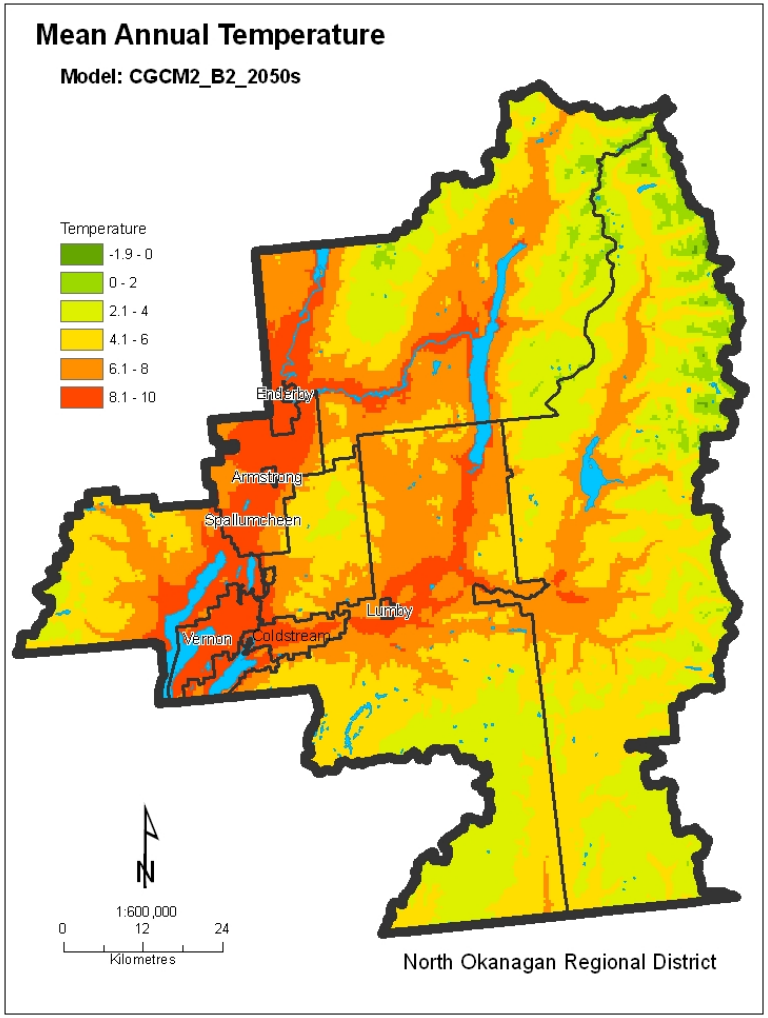
Agricultural Production

<u>Potential Changes to Temperature</u>

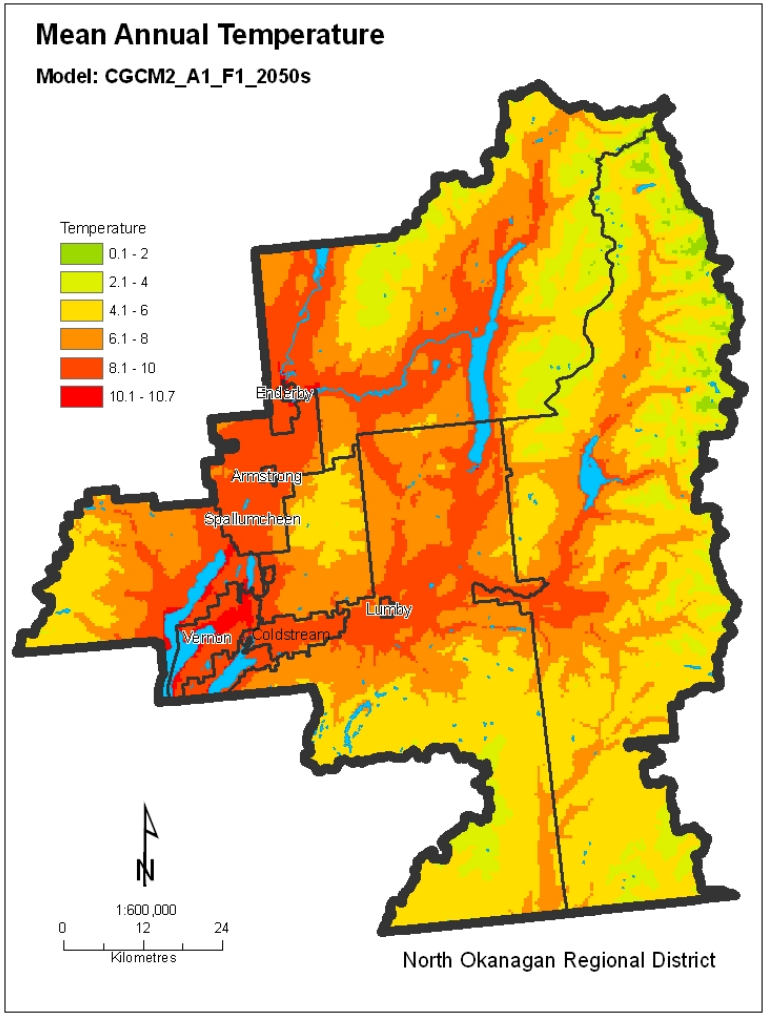
The categories for each set of maps, and the corresponding colours, are consistent. Some maps have additional categories at ether the top or bottom of the range reflecting differences between the mapped data.

The Mean Annual Temperature maps show that scenario B2 reflects an approximate 2C^{o} increase from the historical normal across the region. The A1F1 scenario reflects approximately a 4C^{o} increase from the historical normals. This will result in higher rates of evapo-transpiration.

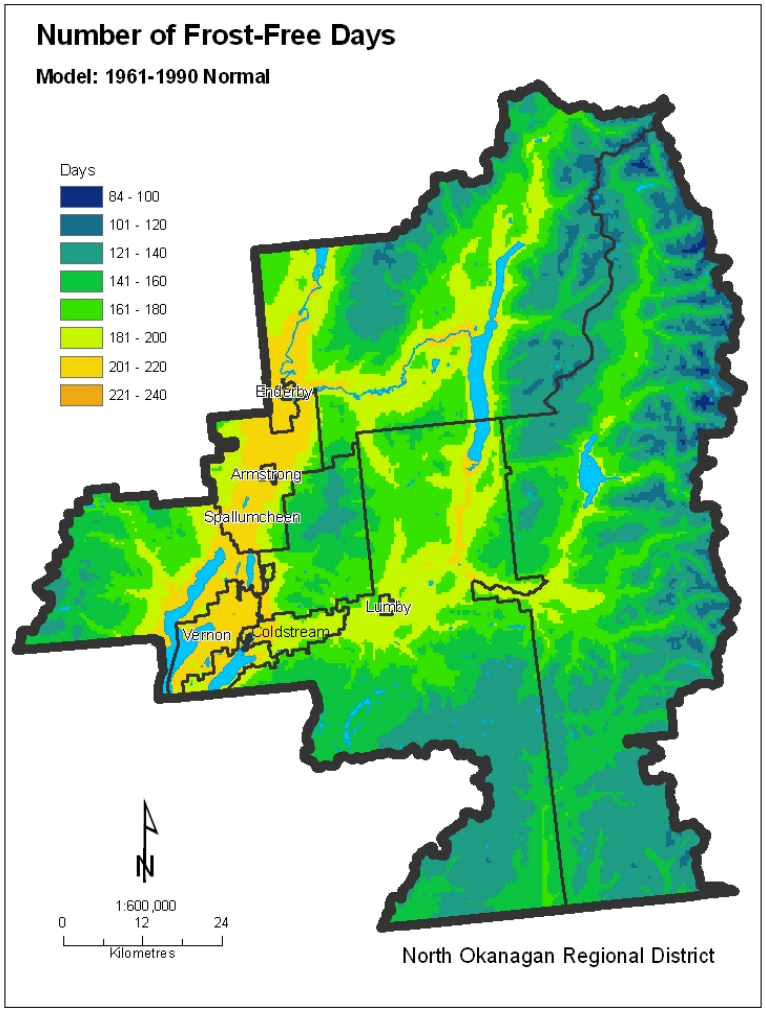
The next set of maps, Number of Frost Free Days, are also associated with higher climate temperatures and show a similar pattern. The B2 climate change scenario shows an increase of approximately 20 frost free days from historical normals. The A1F1 scenario reflects an increase of 40 frost free days from historical normals.



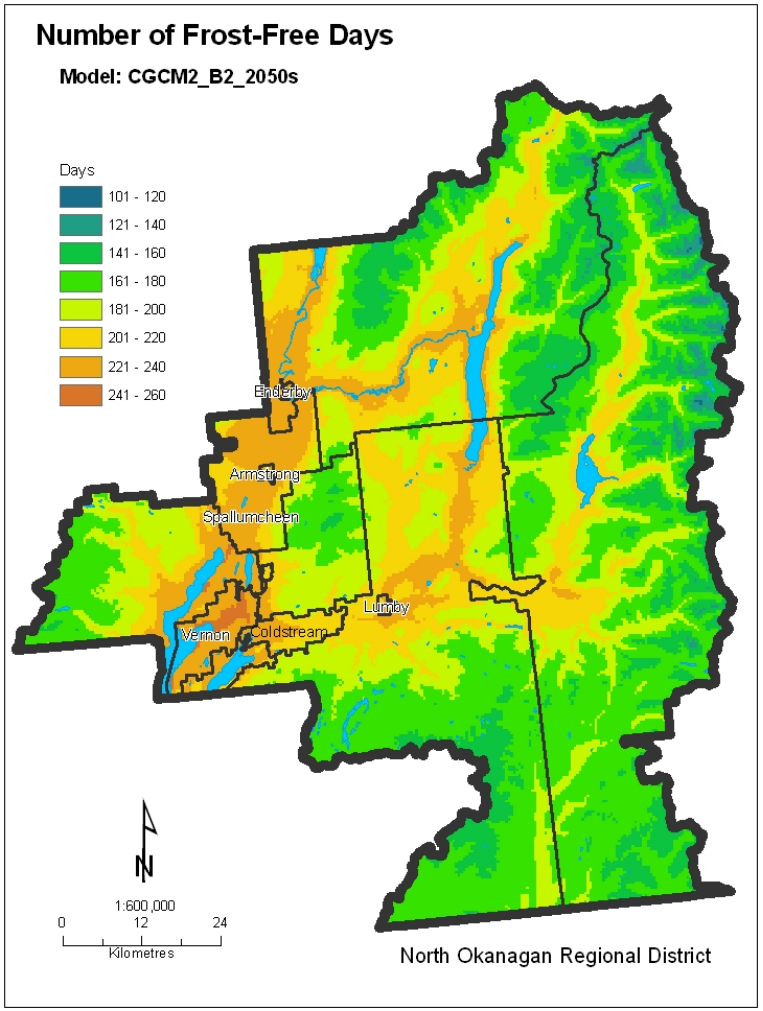
Climate Change Scenario B2 for 2050s



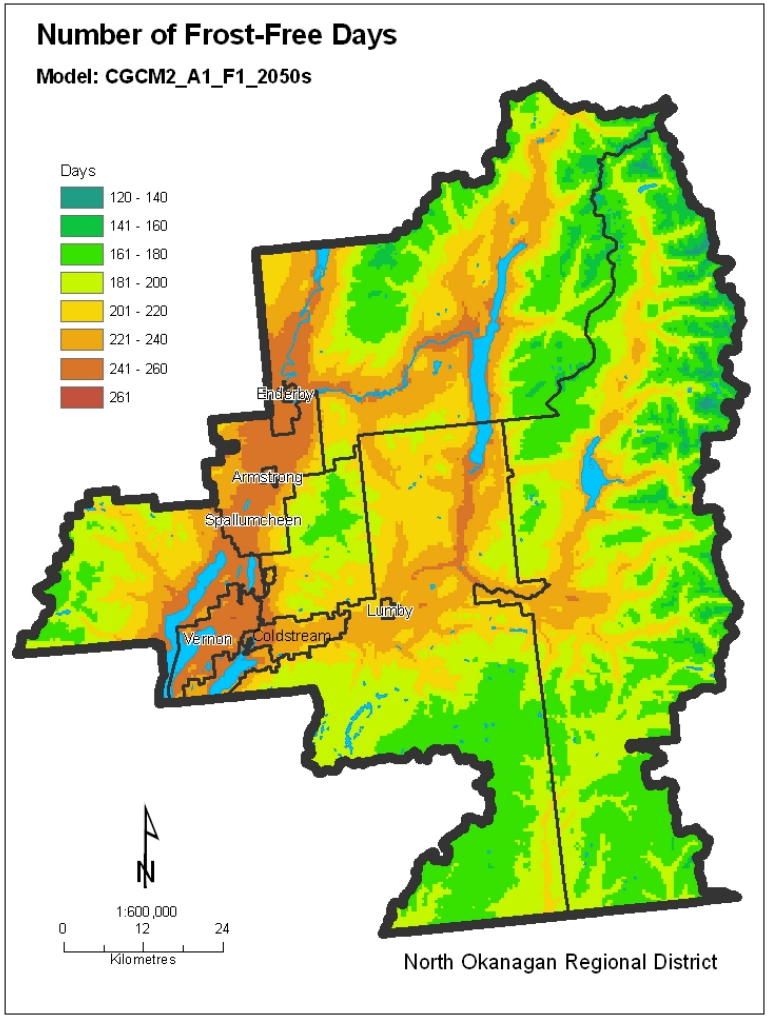
Climate Change Scenario A1-F1 for 2050s



Historical Records 1961 - 1990



Climate Change Scenario B2 for 2050s

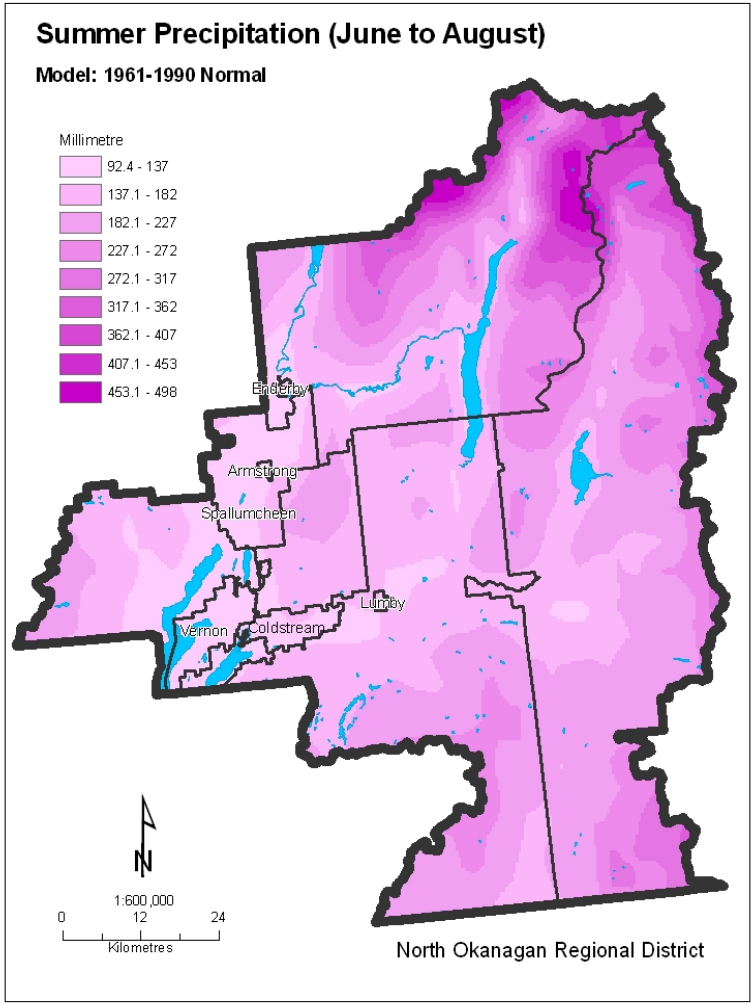


Climate Change Scenario A1F1 for 2050's

Potential Impact of Temperature Changes

on Agricultural Production in North Okanagan Region

- Area suitable for apple production expanded to higher and northern locations
- Peaches, apricots and grapes could become important commercial crops in North Okanagan
- Winter wheat and other cereals an option
- New cultivars requiring longer growing season an option
- Silage corn could be grown over a broader area
- Higher demand for irrigation water
- Longer irrigation season
- Potential for sunscald damage increased
- Winter cold injury reduced
- Increased number of hay harvests
- Longer grazing season on Crown range
- Increased wildfire hazard
- New agricultural pests and diseases



Historical Records 1961 - 1990

Potential Impact

of Climate Change on Climate Variables and

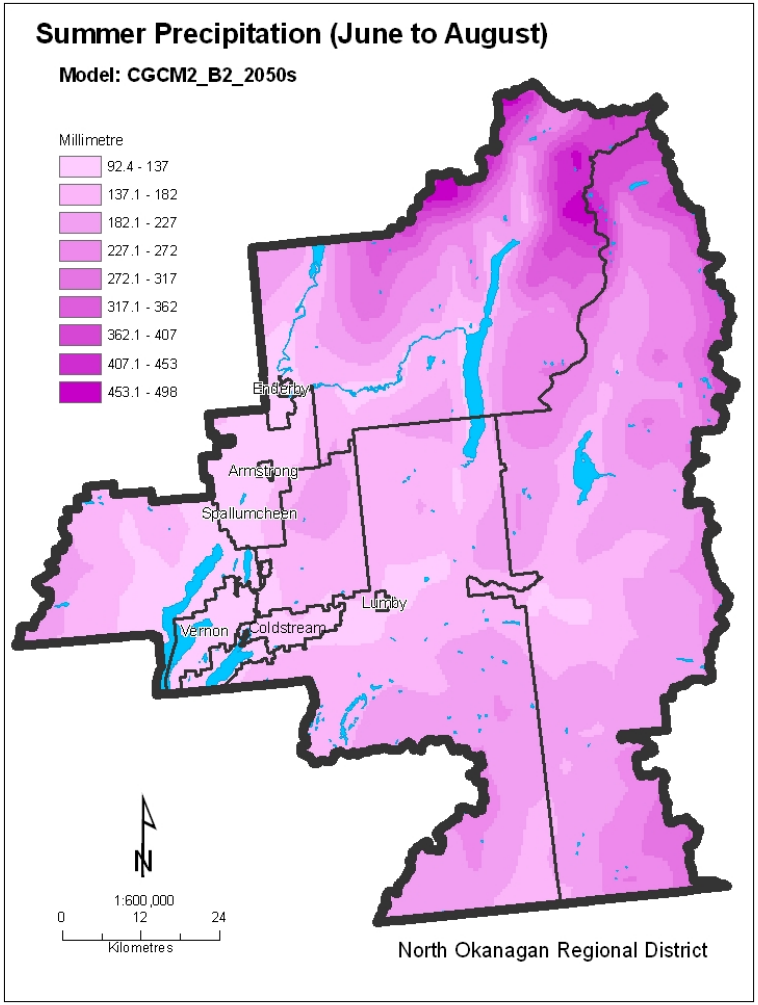
Agricultural Production

Potential Changes to Precipitation

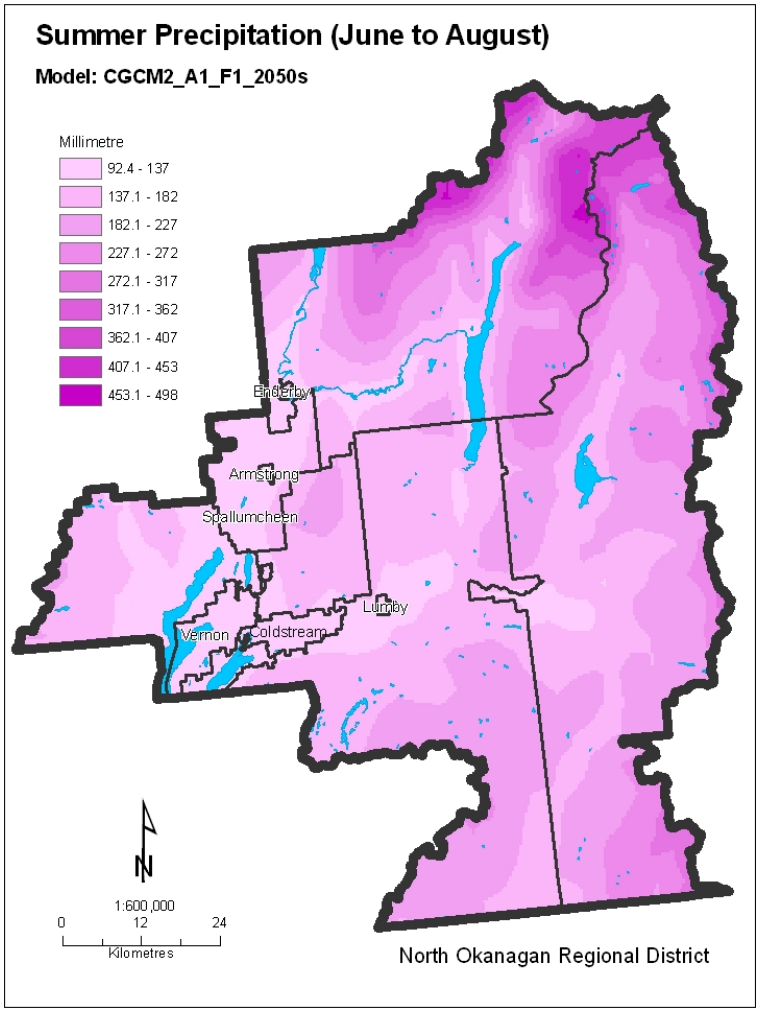
The categories for each set of maps, and the corresponding colours, are consistent within both the sets of maps - Summer Precipitation and Precipitation as Snow. Each set of maps also has the same number of categories reflecting the minor differences in the data between the historical data of the climate variables and the data generated for climate change scenarios.

Careful scrutiny of the three Summer Precipitation maps (June to August) indicates that the map of Climate Change Scenario B2 is slightly dryer than the historical normals. Climate change scenario A1F1 is slightly drier again.

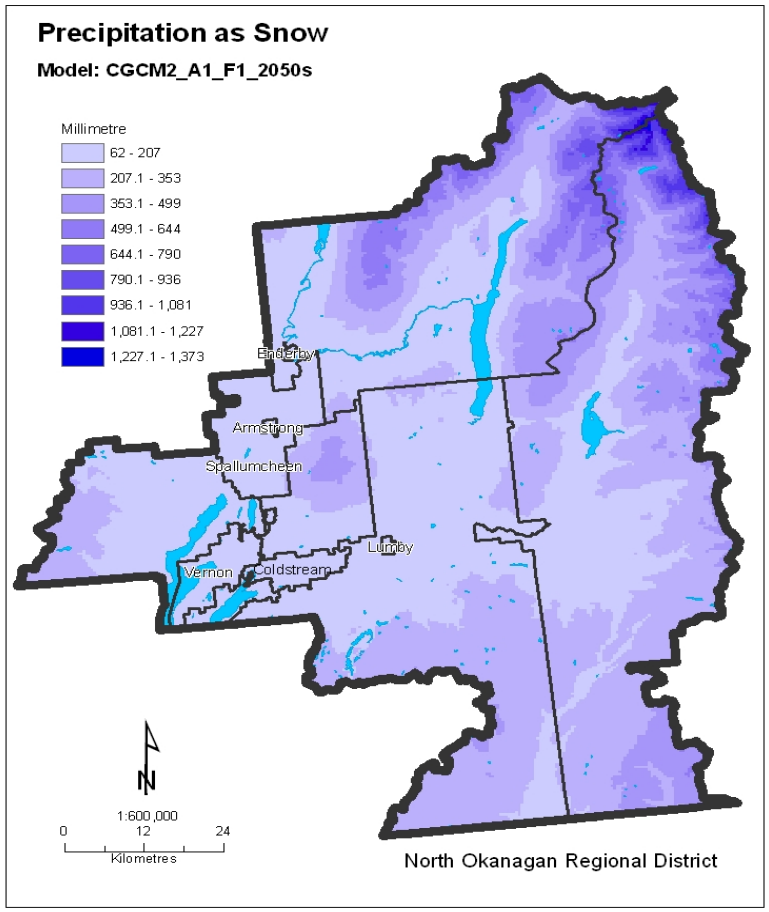
The final set of maps, Precipitation as Snow, reflects potential changes to the climate from both a temperature and precipitation perspective. Across the region, under the two climate change scenarios the amount of snow falling annually appears to be diminishing slightly and conversely, the amount of precipitation falling as rain is increasing.



Climate Change Scenario B2 for 2050s



Climate Change Scenario B2 for 2050s



Climate Change Scenario A1F1 for 2050's

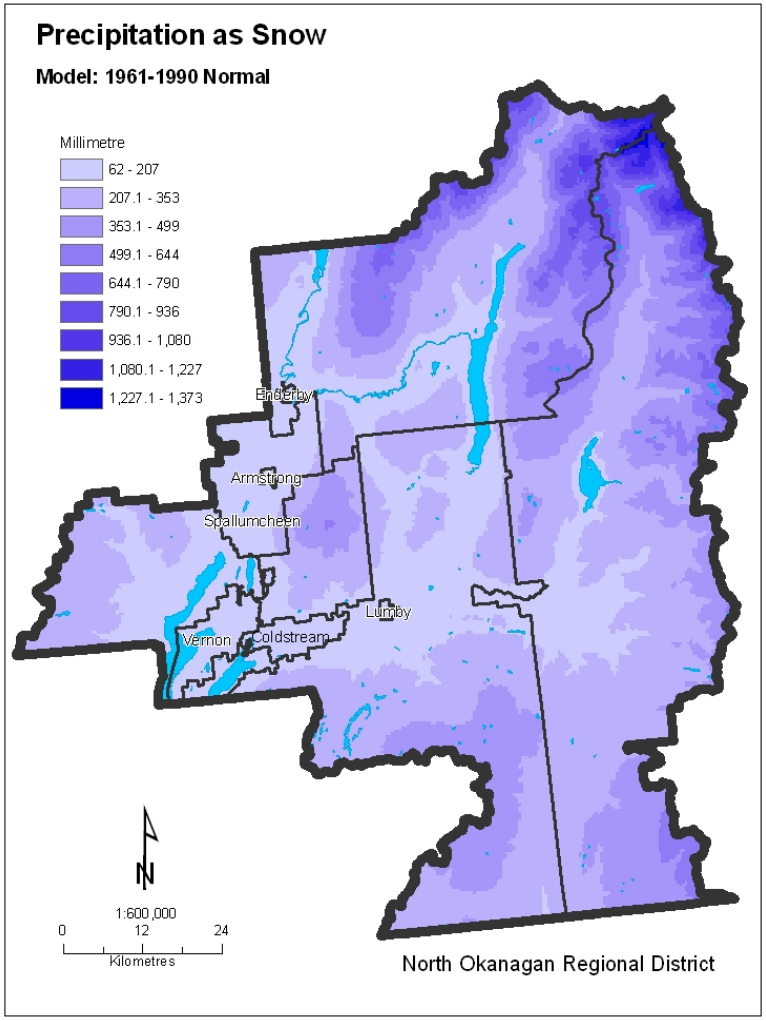
Potential Impact of Precipitation Changes

on Agricultural Production in North Okanagan Region

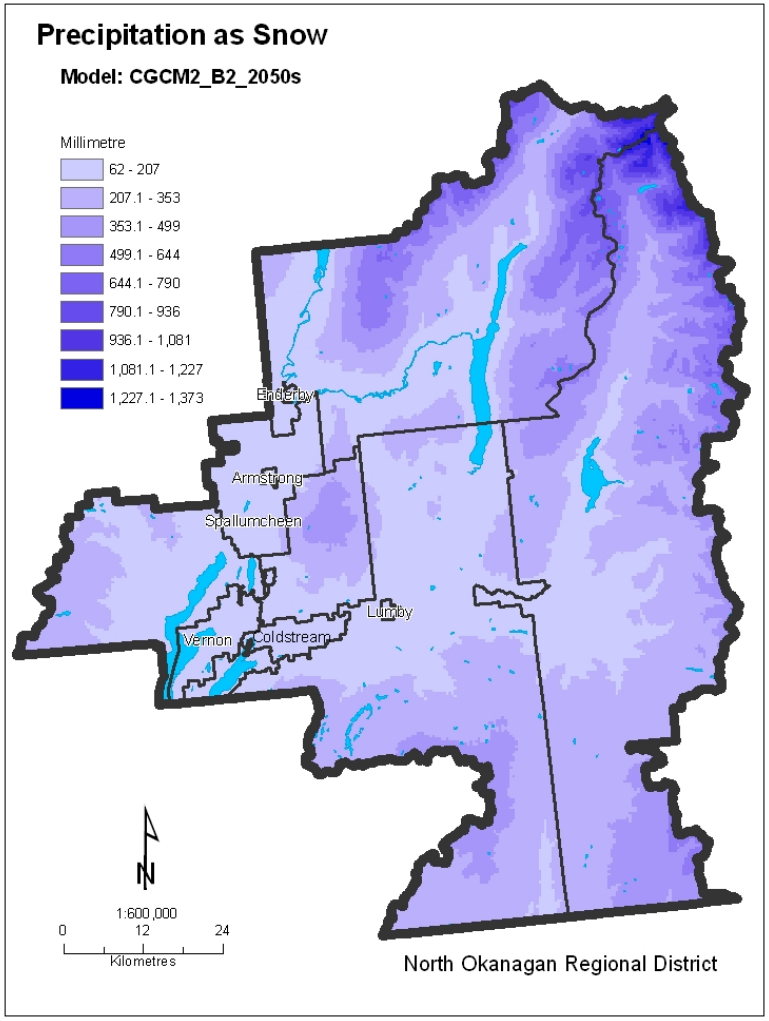
Agricultural production in the North Okanagan region occurs in valley bottoms. The two sets of precipitation maps show the agricultural areas falling within the lowest map categories. Climate change could result in changes to precipitation that could be significant to agricultural production but still fall within the lowest map category. Further research and modeling at a finer scale is required to more accurately predict impacts on agricultural production. Research and modeling is also important to ascertain the impact of climate change on irrigation water supply, irrigation demand, infrastructure, and management.

Nevertheless, some conclusions regarding the potential effects of changing precipitation on agriculture can be made:

- Reduced cherry splitting resulting from decreased summer precipitation
- Increased soil moisture from spring rains for early growth
- Reduced fungal diseases resulting from decreased summer precipitation
- Reduced summer precipitation (and more importantly higher rates of evapo-transpiration) will reduce extent and productivity of dryland farming
- Increased demand for irrigation services due to decreased summer precipitation and higher rates of evapo-transpiration
- Increased demand for irrigation water due to longer growing season (frost free days), reduced summer precipitation and higher rates of evapo-transpiration
- Significant changes to the quantity and timing of flow of water into reservoirs storing irrigation water



Historical Records 1961 - 1990

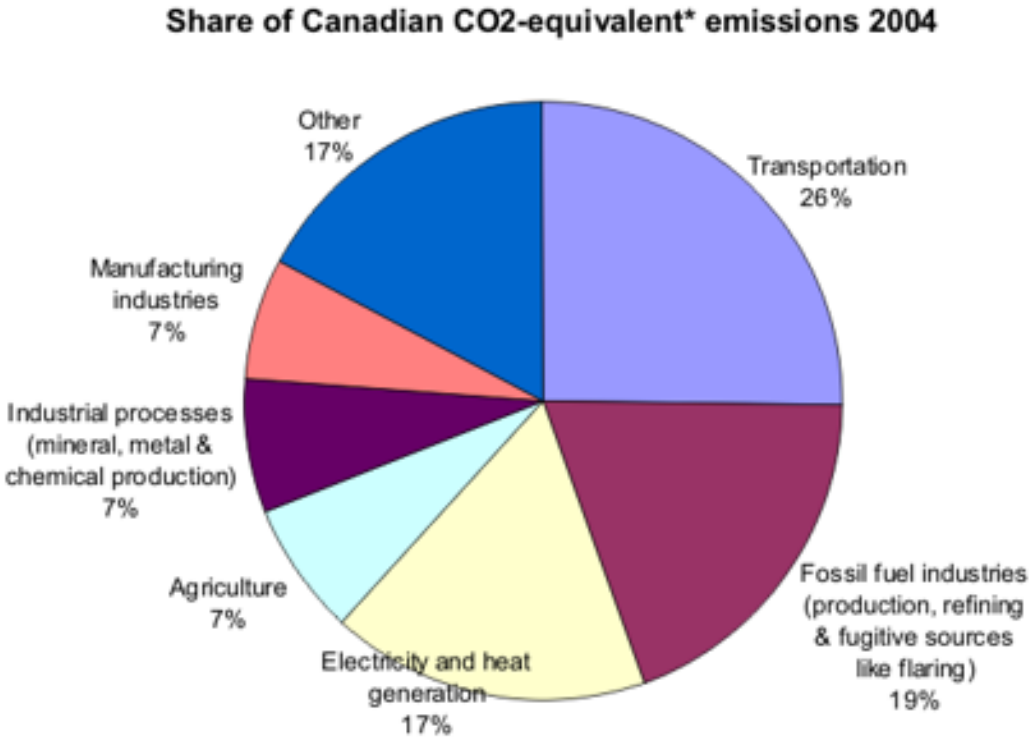


Climate Change Scenario B2 for 2050s

Part 2 - Mitigating Climate Change

Food systems contribute green house gases (GHG) to the atmosphere. Food systems also contribute to the storage or sequestration of carbon in agricultural soils.

The chart below illustrates the net contribution of GHG from various sectors of the Canadian economy. The contribution from the food system is not specified. It includes the entire agriculture sector as well as portions attributed to other categories such transportation and "other'. On reviewing detailed emission data associated with the categories in the graph, it is estimated that the Canadian food system as a whole contributes approximately 10% of GHG emissions in Canada. Because of the type of agricultural operations and farming practices in the North Okanagan, the contribution of the regional food system to GHG emissions is likely less than the Canadian average.



* CO_2 – equivalent emissions are the weighted sum of all Green House Gases

In terms of contributing to climate change, all green house gases are not equal. The following global warming potentials are used as the weights in the chart above: Carbon dioxide (CO_2) = 1; Methane (CH_4) = 21; Nitrous oxide (N_2O) = 310; Hydrofluorocarbons (HFCs) = 140 to 11,700; Perfluorocarbons (PFC) = 6,500 to 9,200; and Sulfur hexafluoride (SF6) = 23, 900.

The CO_2 equivalent of annual GHG emissions from Canadian agricultural sources in 2005 are summarized in the table below:

Agricultural Source	Associated GHG	Emissions in Kilotonnes (CO_2 equivalent)
Enteric Fermentation	• Methane (CH_4) released from the intestinal tract of ruminant livestock (beef and dairy cattle, sheep)	25,000
Manure Management	• Methane (CH_4) released during the decomposition of manure	8.600
Agriculture Soils	• Carbon Dioxide (CO_2) released during the decomposition of soil organic matter as a result of farming practices • Nitrous oxide (N_2O) released by soil bacterial as a result of applications of synthetic nitrogen fertilizer	23,000

From a North Okanagan perspective where there is an extensive areas of forage crops providing feed to beef and an increasing number of dairy cattle, the Canadian figures are likely representative for the region.

A growing body of research is developing in the United States and Europe that uses “life-cycle” analyses of food types to ascertain GHG contributions. The studies trace back and accumulate the contribution of various forms of green houses gases from the consumer’s plate, back through the retail, distribution and processing phases, finally reaching the producing farmers including the GHG contributions from farm practices and farm inputs.

It is anticipated that these types of studies will inform consumers and other decision makers on how shifts in consumer diets from certain food commodities to others can contribute to mitigating GHG emissions and reduce the emission “footprint” of households. These studies will also inform the relative importance of other consumer decisions associated with food including the practice of using “food miles” as an indicator of GHG impacts.

Potential mitigative measures that are associated with the components of the regional food system are listed in the table below:

Component of Food Production System	Contributions to Green House Gas Emissions	Potential Mitigative Measures
Food Production	• Enteric fermentation of ruminants • Manure • Fertilizer applications • Farming practices • Engine emissions • Space heating of farm buildings	• Changes to feed • Anaerobic digesters • Organic farming • Low/zero tillage • Increased efficiencies through insulation, and new technologies
Food Processing	• Space heating of buildings • Engine emissions	• Increased efficiencies through insulation, and new technologies
Food Distribution	• Engine emissions	• Reducing "food miles" through: o Buying local o Building compact communities o Fostering home and community gardens • Encouraging low emission vehicles • Reducing engine idling by restricting "drive thru" restaurants development through land use controls
Food Consumption	• Food choices may differ greatly in their accumulated contribution to GHG emissions from each stage from "farm to fork".	

[i] A description of the ClimateBC program is available in The Climate Network, Vol 10, No.1, April 2005 published by the Canadian Institute for Climate Studies http://www.genetics.forestry.ubc.ca/cfcg/res_climate-models/CICS%20Newsletter%200405%5B1%5D.pdf

ii IPCC Special Report on Emissions Scenarios www.grida.no/climate/ipcc/emission/003.htm