## Quesnel Agriculture Centre Feasibility Study

# Final Report

*Presented to:*

## City of Quesnel

*Submitted by:*


**Toma and Bouma Management Consultants**
**Edmonton and**
**Lionsgate Consulting, Vancouver**


May 11, 2016

May 11, 2016

Ms. Amy Reid, Economic Development Officer
City of Quesnel, 410 Kinchant St.
Quesnel BC, V2J 7J5

Dear Amy:

RE: Electronic Report Submittal

Please accept this letter as notification of transmittal of the final report of the *Quesnel Agriculture Centre Feasibility Study* being submitted to City of Quesnel.

This report examines the feasibility of a new agriculture centre in Quesnel which should support and stimulate development of farms and agri-businesses in the North Cariboo region. The technical, market and financial characteristics of a Centre concept were studied in conjunction with local community, producer and business support.

During the course of study we were informed by more than 80 stakeholders on their needs and top issues. We believe the feasibility for a local centre and support programs is positive but there are also challenges. A recommendation is made for a three year pilot of the centre concept including a review with possible stakeholders and funders to ensure a successful startup.

We thoroughly enjoyed working with yourself, the City and the community on this project and trust you will find this report satisfactory. We also do appreciate the assistance of you and the others involved in the project.

Sincerely,

Steve Nicol, MBA, CMC
Darrell Toma, MSc, PAg, CMC

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## Table of Contents

# 1 Agriculture Centre Plan Summary

## 1.1 Project Objectives

This project required a feasibility study of a new agriculture centre in the Quesnel region. The objective is to help encourage retention, expansion and development of agri-businesses and farms in the North Cariboo region.

## 1.2 Findings

A feasibility study needs to assess the technical, market and financial feasibility within the concept and an understanding of the possible viability, community interests and project needs.

### North Cariboo Region Farms and Demand

This region is located about 8 hours north of Vancouver and is an agriculture production region, mainly in beef cattle and forages/ cereal crops. In addition, a number of specialty vegetable and fruit growers are operating in the region. A total of 394 farms (North Cariboo) have a revenue value of about $19 million (2011) and invested capital of about $494 million. The Cariboo region is reported at about 1,123 farms and revenues of $55.3 million (2011) and an investment of $1.4 billion. From the Quesnel farm community meetings and other direct interviews, it appears that demand for services does exist and owners are seeking help.

### Agriculture and Food Centres

A review of agriculture and food centres was completed and many examples exist. Canada has about 20 food development centres to help in ingredients, product design, formulation, testing, packaging and other areas that are needed in pre-commercial tasks. These centres tend to be operated by the Federal or Provincial Governments. Another type of centre has emerged with colleges and universities developing and managing the centre with a regional or local focus. The USA and Canada have a number of these operating and in BC, University of Fraser Valley has a new Ag Centre of Excellence.

A third type of farm applied research activity has developed in Western Canada with farm associations (and is increasing). They serve local farm members, are small operations and generally complete crop and fertilizer trials. The review of these various agriculture and food centres shows that the concept is technically feasible and best practices can guide the centre.

### Market Comments

Community meetings and direct interviews (and an e-survey) were completed. About 60 people came to meetings and another 20 people were interviewed. The top farm interests are:

- Strawberry and soft fruit crops (how to grow?);
- Hops- new trials and malt barley;
- Vegetables (9)- both field and greenhouse;
- Community gardens and local food;

- Forage and grain production for livestock use;
- Livestock (mainly beef cattle (7), also alpaca, poultry, rabbits);
- New crop opportunities;
- Processed foods- not sure what types but likely baked goods, canned products;
- Use of community kitchens.

Who was helping the farmer now? The responses varied on the key information or learning sources for farmers as:

- Personal farm friends and local personal or industry networks;
- No one, so individual trial and error;
- Farm associations such as the BC Cattlemen's, Forage Council;
- Internet websites and mainly USA sources, although BC Agriculture has some information;
- Print sources- farm and industry magazines;
- Local agriculture and food organizations which bring out speakers or which create their own information and share expertise;
- Ag-Hort LEAP program- now stopped.

What was needed? Responses included:

- A person (professional/ experienced) who can help in gathering technical information and showing how to adapt research/ ideas for local conditions (31);
- Centre of education for new entrants and people looking for new opportunities;
- Technical information, knowledge and local professional advice;
- Coordination and communication- to farmers and for consumers;
- Master event calendar and awareness of speakers;
- Geographic scope- to focus first on the North Cariboo region and if possible to assist others in Prince George and Williams Lake;
- Public- private operation;
- Education and assistance to farmers on production and marketing topics;
- Support for the small-scale and part-time farmer.

This third response shows a market gap in the region for a much needed resource to be delivered through a new regional Agri-food Innovation Centre. A number of organizations and funding aspects will need to be developed further and validated with the community, famers and the potential user groups.

**Recommendation**

Based on the feasibility review completed herein, it is recommended that a final business plan and consultation be carried out towards start-up. Funding in the order of $200,000/ year for three years is needed. This next step will help in the decision process and allow for confirmation of the possible partners' roles and funders.

# 2 Introduction and Objectives

**Background to the Proposed Centre Concept**

The study was commissioned by the City of Quesnel but it is understood that the study area is the North Cariboo. The new agriculture centre would be a strong regional organization fostering collaboration among industry partners, providing practical agriculture and food solutions for technical challenges and opportunities. It will help the regional farming and agri-business industry. The City of Quesnel is one of the most forestry dependent communities in British Columbia and the hardest hit by the mountain pine beetle epidemic. Economic diversification is a key priority for Quesnel. Agriculture, food processing, and crop production have been identified as opportunities for diversification.

The agriculture centre could provide applied research, opportunity identification and agri-industry training as well as being a knowledge hub of best practices to help:

- Local primary agriculture industry;
- Value-added agriculture products sector; and
- New agriculture technologies and practices.

The activities of the centre will be driven by North Cariboo regional farm and agri-food industry needs and priorities and focus on delivering practical solutions to technological challenges and opportunities. It is expected that communities, farms and others in the region would be the recipients of direct benefits resulting from this project. A May 2015 workshop provides some direction for this project and concluded on 5 main areas for actions:[a]

- large umbrella organization;
- wool mill;
- local and regional food policy;
- young farmers mentoring; and
- producers for farmers' markets.

The City of Quesnel and key agriculture stakeholders have identified the need for an industry supported agriculture centre. It would maintain and enhance the economic advantage of BC's agriculture sector in an increasingly competitive world economy: an economy that is increasingly reliant on innovation and the adoption and implementation of new technologies to remain competitive.

The objective of this study:

- *"The overall objective of the Agriculture Centre is to encourage retention, expansion and development of agri-business in the North Cariboo. The Centre must be self-sustaining and not reliant on grant funding in the long term."*

The suggested project tasks included (from RFP):

[a] The Quesnel Community and Economic Development Corporation (QCEDC), North Cariboo Agriculture Forum, April 22, 2015, in partnership with the Ministry of Jobs, Tourism and Skills Training.

"*Project Tasks:*

1. *Meet with economic development staff, the project steering committee, and local stakeholders, and review relevant materials to determine existing agricultural resources available in the region and potential purchasers of locally produced agricultural products.*
2. *Investigate best practices and various models of successful agriculture centres in other jurisdictions that have made a positive impact on the agriculture sector and the local economy.*
3. *Present well-researched potential services of an Agriculture Centre to local stakeholders in a workshop setting to determine the needs of local producers.*
4. *Consider climate, transportation, current and potential crop production, demographics, demand, existing infrastructure, and local history throughout the development of the feasibility study.*
5. *Prepare an interim report and presentation from which the steering committee will select options for further research and development to be included the final report.*
6. *Prepare a final report and presentation of the report for Council, the steering committee, and engaged local stakeholders to be held in Quesnel at the completion of the project.*"

The scope involved desk research, several community meetings, an e-survey, industry interviews and analysis of the findings on the feasibility of an agriculture centre.

We appreciate the help and direction kindly provided by the City of Quesnel and the Steering Committee for their keen interest and support. It was also very important to have participation of the people at the meetings and the direct interviews. The Steering Committee included:

- Lynda Atkinson, BC Agriculture Council/FARMED/Growing North Cariboo/Sister's Creek Simmentals;
- Rob Borsato, Past President Quesnel Farmers' Market/Kersley Farmers' Institute/ Mackin Creek Farm;
- Dylan Cash, Cariboo Regional District Director Area I;
- Jennifer Catherall, College of New Caledonia;
- Emily Colombo, Regional Manager Ministry of Jobs, Tourism, and Skills Training;
- Fred Harder, Sister's Creek Simmentals;
- Omer Hrbinic, Aroma Foods;
- Byron Johnson, City Manager, City of Quesnel;
- Greg Lawrence, Community Futures North Cariboo;
- Amy Quarry, Edible Quesnel/Small Town Love;
- Amy Reid, Economic Development Officer, City of Quesnel; and
- Craig Sherstan, Savalas' Restaurant.

Other input was provided by: Morgan Ross, College of New Caledonia, George Powell, consulting Agrologist, AgForInsight, and Erica Nitchie, First Nations Business Agrologist, Ministry of Agriculture.

We sincerely appreciate the important contribution of these people to the project.

# 3 Agri-food Sector Trends

The agri-food sector is a globally focused sector and has a number of driving trends which influence its growth and developments. These trends are briefly highlighted below and provide a context for the need for a centre.

Trends can be viewed in several ways- within an industry (such as beef, grains, fruits), from the market and consumer needs (safe food, local food, urban foods) and from industry structure (fewer farms but larger farms, more capital and larger, specialized equipment). The main structure trends over the last century can be viewed as some major shifts in farm management approaches and in technology applications:[b]

- End of frontier era- 1900s;
- Mechanization applications- 1910s;
- Scientific agriculture & principles- 1930s;
- World commodity markets- 1950s to 1970s;
- Food production systems- 1980s;
- Information/ technology/ globalization- 1990s;
- Life Sciences/ renewables/ automation/ animal health & care- 2000s; and
- Sustainable green economy, food security/ safety, greater regional trade- 2014+.

Currently the sector is moving to a higher level of management which involves precision farming, animal care and animal welfare, environmental farm plans, on farm food safety and greater reliance on protocols. Many more changes are occurring and understanding and adapting is also becoming more challenging for both large farm owners and small-scale farmers. Other emerging product trends are evident and causing new ways to operate.

Some other product and operating trends include:

- Value-added products- foods, ingredients, beverages;
- Renewables- bio- products, bio-energy, biomass uses;
- Food for health & functional foods/ nutraceuticals;
- Obesity & food- health connections;
- Rural tourism and regional approaches involving local foods;
- Entrepreneurship, new business starts allied to a farm;
- Many new technologies (within farm gate and outside in supply chains); and
- Less government extension/ help/ growth of private sector supports.

The agri-food sector has a number of opportunities for growth. These are represented in the diagrams below as market opportunities which can be developed.

[b] D. Toma, Knowledge Guide, Best Management Practices of Leading Farmers, 2007

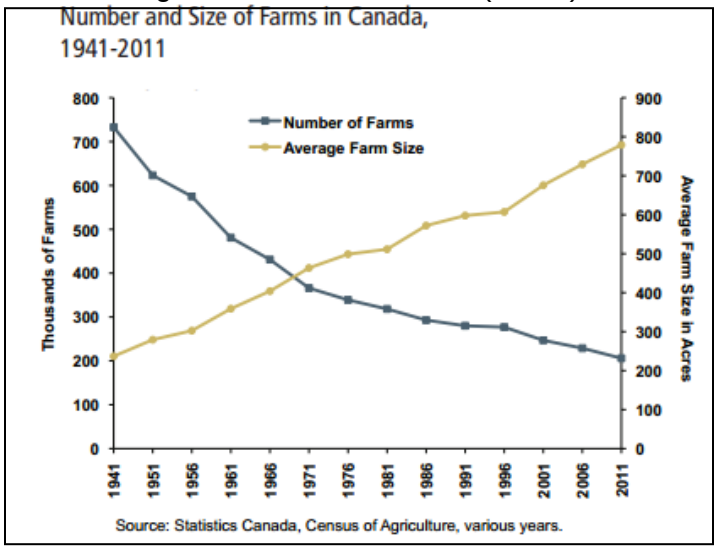
Figure 1- Agri-Food Sector Opportunities


The top sector opportunities for Quesnel are likely: commodity crops and livestock, vegetables, some specialty crops, local foods and some processed products (fibre, baked goods, other).

The 2011 Canadian census shows nearly half (48.3%) of farm operators were 55 or older, compared to 40.7% of farmers in 2006. The total number of farmers is declining rapidly. As of

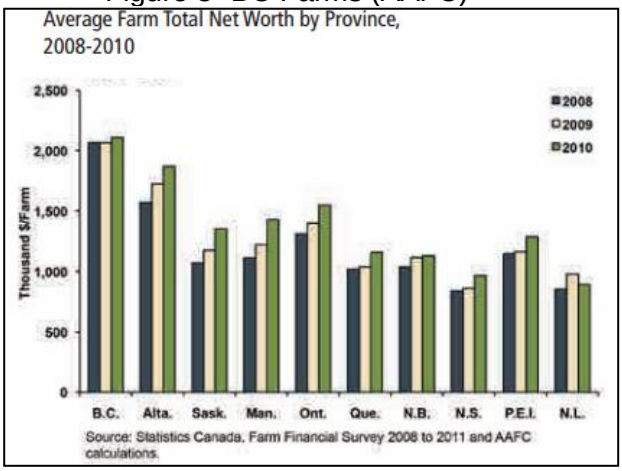
2011, there were 294,000 farm operators or a 10.1% decline from 2006. Of this total, 73% of farmers are male and 27% are female and only 8.2% of operators were younger than 35 years old. Quebec has the youngest farmers, with an average age of 51 years. British Columbia's operators had the highest average age at 55.7 years old.[c] A long term trend is the declining number of farms and increasing farm size.

Figure 2- Canadian Farms (AAFC)




Average farm net worth is noted in the chart below and shows BC farms are the highest for the period reported.

Figure 3- BC Farms (AAFC)



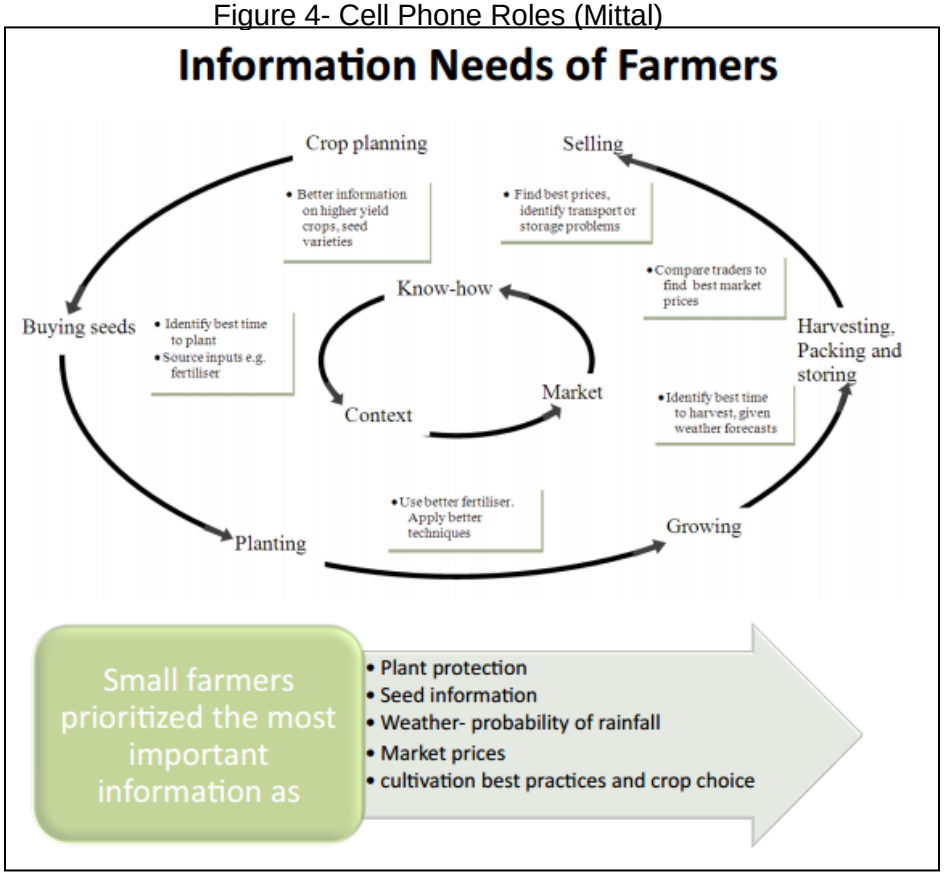

Some of the other social and technology trends which are notable to be of use to the sector include: demographics issue of aging farmers (succession) and a need for new entrants, automation and labour-saving devices (GPS, precision farming, robotics, sensors, etc.), innovation

[c] Agriculture and Agri-food Canada, Overview of Canadian Agriculture and Agri-food, 2013

(products, processes, organization), mobility (smartphones, RFID tags, wireless) and e-commerce/ social media hubs and integrated supply chains and alliances. Some of these products can offer assistance to farmers to be more competitive and substitute capital for labour where appropriate.

These products can be highly useful in a rural remote area like Quesnel. Mobility and distance learning can be provided with wireless and the internet (websites) using valid knowledge and related decision tools (accessed by the user when needed). Smartphones can be used for decision tools (apps) and knowledge sharing by farmers. The role of cell phones is increasing with collaboration, information sharing, knowledge building and technology transfer. As an example, Mittal notes the information needs of Indian farmers in North America in understanding markets, crops and other aspects. Some lessons can be learned from the example as knowledge transfer and information is needed in the region to help Quesnel regional farmers and small-scale food processors. Given today's dynamic markets, these are very important considerations.

Figure 4- Cell Phone Roles (Mittal)




He indicates the need for helping build a stronger second green revolution with cell phones. *"A push towards higher agricultural productivity will require an information- based decision making agricultural system".*[d]

[d] Mittal Surabhi, The Role of Mobile Phones in Agriculture Growth, Mobile Plus Conference, September 2011

He notes several important points relative to this technology use in agriculture:

- The contribution of ICT to all parts of the agriculture cycle;
- Impacts are seen in increases- income, improved yield and non- quantifiable gains (social);
- Benefits of improved communications, information about education and health;
- Improved access to information and reduced search costs;
- Greater market participation and crop diversification;
- Improved coordination among agents and increased market efficiency;
- Reduces risk by connecting to social networks; and
- Strong correlation of higher GDP with mobile phone use.

A framework of possible extension/ knowledge transfer farming tools and mobile applications is noted as important for a remote rural region like Quesnel. How the information is delivered will vary from face to face and in group settings to direct one on one meetings and farm demonstrations. These methods are very important to consider in a centre.

Similarly, the topic of e-commerce is a related area for both niche product market research and for developing and marketing to customers. Websites for advertising and marketing, having a customer relationship management function, and other e-commerce (direct sales, marketing) is not commonly performed well by agriculture and small-scale food businesses. These are all areas in which education, applied research and technology transfer can help build innovative and new beneficial practices (and cost-effective) for the sector. More can be done here.

The BC Agriculture & Food Ministry (2012) has profiled the agri-food sector challenges. The primary agriculture and food processing sectors generated $9.6 billion (2010) with farm cash receipts for primary agriculture estimated at $2.4 billion. In 2006, 10.2% of the province's farms generated about 80% of the provincial gross farm receipts (Fraser Valley). Commodities generating the largest revenues (2010) included dairy, poultry, floriculture & vegetable greenhouse and beef. The report notes some key climate change issues for BC farms:

- Temperature- to increase by 2020s, more frost free days;
- Precipitation- to increase by 2020s, up to 7% more, snowfall decline;
- Extremes- to increase by 2020s, hot and less cold weather, more wildfires, rains;
- Hydrology- varies by 2020s, increase runoff, dry conditions, water peaks vary; and
- Sea level rise- increase by 2100 in the Delta and at Nanaimo.

That report notes the climate change topic will require many actions to help farms and the sector deal with adaptation, monitoring, knowledge-building and new industry approaches for a sustainable system.[e]

The BC Government agri-foods strategy (The *BC Jobs Plan Agri-foods Strategy)* has three key priorities, which are relevant and important to the Quesnel region:

- Focus on high-quality, high-value products;
- Expand domestic and international markets; and
- Enhance the agri-foods sector's competitiveness.

[e] BC Agriculture & Food, Climate Change Initiative, 2012

The BC strategy has a target of $14 billion in revenues by 2017 (up from a current $7.2 billion) through more innovation, market expansion and product developments. This increase is a dramatic and aggressive goal. Other ideas include more supply chain developments and value added opportunities, with few specific "how-to's". The proposed actions are:

- Ensure a safe food supply;
- Development of Innovative Products & Processes;
- Strengthen Domestic Markets;
- Expand International Markets;
- Grow the BC Advantage;
- Secure a Strong Future for Farming; and
- Sustainable Land Base for Production.

For BC farm production and community interests, the aging of the farm population, concentration to fewer and larger farms and high capital investments means the use of more technology and other labour substitution methods to maintain and increase productivity. The BC farm sector is moving to more specialized crops and higher value crops. This crop change implies a need for more specialized advice and improved management techniques.

Koch reports on BC trends (2011) which reflect the changing industry within a changing society. She notes three key areas for sustainability of the sector and concurs with other researchers:[f]

- Economic;
- Environmental; and
- Social.

She notes the economic keys for development as: capital costs (land, quota, buildings), carbon tax, input costs (fuel, fertilizer, feed, labour), net farm income, public spending on agriculture, alternative energy, carbon as a crop and by-product utilization. The environment areas include: access to land & water, agriculture & wildlife interfaces, environmental regulations, environmental farm planning – best management practices, utilizing by-products and climate change. The social areas include: agriculture's image, rural/ urban interface, animal care, food safety & traceability, BC Young Farmers and food trends. She notes the need for research and extension activities for farm adaptation.

The farm sector and economic trends noted above provide an overview of the need for high quality and safe food production targeting both domestic and international market opportunities, and of course (hopefully) providing a profitable return to the farm sector. It highlights the role of both current and emerging technology as a tool and the importance of knowledge transfer and best practice education and awareness. Farmers have a lot to deliver in the strategy.

[f] Koch, Christine, Sustainability in BC Agriculture, March 23, 2011

# 4 North Cariboo Community Findings

## 4.1 North Cariboo Economic Development Overview

A review of demographic and economic trend data suggests that agriculture could be playing a more prominent role in the regional economy providing there is adequate guidance and greater capacity for increasing production. Quesnel's population of approximately 9,800 is smaller today than it was in 2001, and although there is expected to be modest growth moving forward, growth rates will lag the province by a considerable margin. Over the next 25 years BC Statistics estimates that Quesnel will grow by 6%, versus 35% for the province. Growth for the Cariboo Regional District will be about the same as Quesnel, so neighbouring communities are facing the same future in terms of their demographic structure (BC Statistics 2015).

On the economic front, the North Cariboo and indeed the entire Regional District is very dependent on forestry for its household incomes and economic base. It is estimated that up to 75% of the jobs in the Cariboo are tied, directly or indirectly, to the forest sector, which includes the logging, wood processing and forestry service industries.[g] Unfortunately, the jobs and incomes of the past are not guaranteed in the future, and with the implications of the pine beetle epidemic now being seen in declining harvest volumes and mill utilization, there is much uncertainty about what the forest industry of the future will look like in Quesnel. The forest sector labour force declined from 3,015 in 2001 to 2,370 in 2011, a drop of 21%. Continuing losses since then will be quantified in the 2016 census.

Meanwhile, the public sector labour force (health, education and public administration) increased in size, though only modestly between 2001 and 2011, so it was able to provide at least a measure of stability for the community. The public sector may not grow that much in the future, however, except health services which will have to increase to deal with the aging population.

Mining, tourism, construction, transportation and professional/technical services also create wealth for the community, but at this time they represent small components. The potential for mining in the Cariboo is good but the industry is highly volatile and subject to macro- economic factors that are almost impossible to predict with confidence. The one major development project, Blackwater, may benefit Quesnel providing road access is developed.

Tourism is an important sector as well, especially for the hospitality sector in the City proper and the lodges, resorts and camps that cater to outdoor recreation visitors, including hunters and fishers. Like mining, however, tourism in the future is somewhat uncertain. Many visitors to the region are actually visiting friends and relatives so if the population does not grow, that important segment of the market will not either. The pine beetle has had a major adverse impact on visual quality and created issues for many backcountry operators.

However, there are still some exceptional destination attractions such as Barkerville, Bowron Lakes, Quesnel Lake, the Alexander Mackenzie Heritage Trail and others that will continue to attract new visitors to the region. The sector is likely to grow in the future, but gains are expected to be modest.

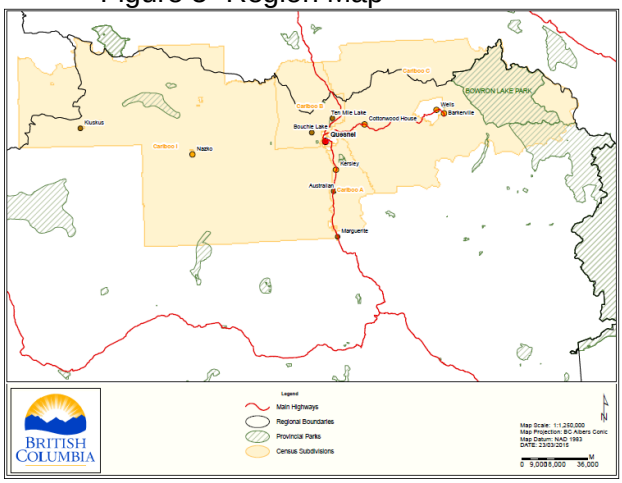
[g] Horne, Garry, 2009. British Columbia Local Area Economic Dependencies: 2006. BC Stats. Victoria, BC.

The other sectors could provide some increased activity in the future but it is worth noting that a population that is both holding steady and aging, as Quesnel's is, will see a declining labour supply in the future. This will make it very challenging for all industries to attract the necessary skills and experience to maintain their capacity and production. The growth opportunities for the agri-food sector in the North Cariboo region can help broaden the economic base in the region.

## 4.2 North Cariboo Agriculture Industry Overview

The North Cariboo region is large and has many ranches and smaller farms. The region of study is shown in the map below.

Figure 5- Region Map




A summary of prior regional studies which have been recommended is given below. This knowledge base shows some of the barriers to development, needs and gaps that must be addressed for business growth and new starts. Several other related regional agriculture and food projects are also listed.

Figure 6- Regional Studies

| Study, Year | Comments |
|---|---|
| North Cariboo Agriculture Awareness and Marketing Project, 2006 to 2016 | Several components- branding, highway signage, Farm Products Map, Kiosk, Junior Farmer Program, Capacity Development, Marketing products/ FARMED Website, brochures, tours. |
| North Cariboo Agriculture Forum, 2015 | Priorities- large umbrella organization, wool mill, local and regional food policy, young farmer mentoring, producers for farmer markets |
| Climate Action Initiative | Three projects including: wildfire planning/ resources; agriculturally significant dams; livestock surface water; and regional research alliance potential project (2016). |
| Beyond the Market, 2010 to 2014 | Operated in Prince George (highway 16) as a business support/ training/ marketing model. Have 2015 proposal for provincial extension program at $333,000 annually. |
| Ag Hort Leap, 2011- 2014; 2013 not done | In January 2011 a community workshop was hosted in Quesnel for adults and youth interested in Agriculture and Horticulture. Cost $34,000 over 3 years. |
| Agriculture Enterprise Development Centre Feasibility Study South Cariboo | Needs included- large majority (70% support) of the producers surveyed favour the creation. 260 farms in the South Cariboo and |

| | |
|---|---|
| and Surrounding Region, 2009 | 900 more in the greater Cariboo-Chilcotin could be served by the Centre. Half the farms and ranches produce beef, followed by horses, forage, other crops, vegetables. Focus- education, business development, networking, product development, marketing. Now operating at small-scale. |
| Economic Development Association of BC, 2009 | A common industry in rural communities is agriculture. Both the agricultural and natural resources industry are highly dependent on external prices. Concludes 12 common practices help rural communities. Concludes that can be a bio-economy vision for Quesnel which needs $200 m |
| Cariboo-Chilcotin Beef Industry Cluster, 2008 | Examined the need to build a beef cluster. Reviewed freezer-chilling facilities, a branded beef strategy and processing. Determined a freezer is not needed at this time. Suggested cooperative action as key to success. |
| Cariboo Region: BC Agriculture & Climate Change, Regional Adaptation Strategies | Workshops with some data. Indicates the growing degree days will increase in the region, due to warmer temperature (+2C) by 2050. |
| Wood Enterprise Centre Update, 2007 | Wood Enterprise Centre closed. Offered specialized services and equipment. Focus areas- products, production, skills training and business/ technical consulting |
| Inventory and Synopsis Of Agriculture Development Studies and Initiatives For the Cariboo-Chilcotin, 2006 | Common sector development opportunities:<br>• Capture greater local and provincial market share;<br>• Production and value-added processing for niche markets;<br>• Additional finishing and value-added processing operations;<br>• Integrated opportunities for production and marketing;<br>• Strategic partnerships to facilitate communication, policy development, and common goals;<br>• Education and training on production, markets and marketing;<br>• Changing demographics and consumer preference for fresh foods and healthy products;<br>• Regional agriculture sector organization to provide a unified voice for the sector; and,<br>• Co-operative organizations and strategic alliances. |
| Agriculture Web-based Enterprise Tool | Web based tool was the direction given to CCBAC by local area agriculture businesses to analyze the business opportunities in various product lines including berries, fruit, vegetables, livestock and field crops. No one managing it now. Cost $227,000 |
| Cariboo Central Interior Poultry Producers Association | Project intends to create economic diversification in communities by developing the poultry and rabbit sectors. A mobile abattoir has been in full production. Cost $75,000 |

Source: websites and Committee information.

**Discussion**

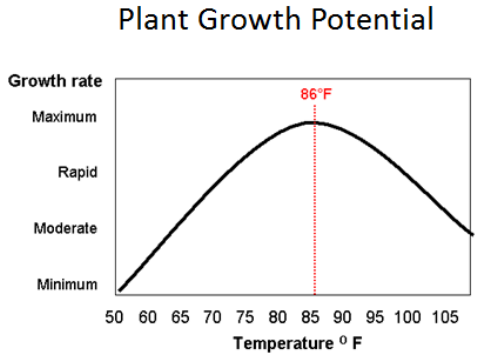
The studies above show that the region has a number of gaps which a specialized organization can address on behalf of the agriculture and food industries. The studies also indicate the degree of farmer need has not waned. The recent 2015 Quesnel workshop highlighted five current areas of interest to farmers, small-scale food processors and the community. The need for agriculture industry support (due to a gap) continues to appear among the various projects. The web-based tool for marketing is viewed as a failure and it appears that no one is managing the site now

(industry comment). A beef industry study (MNP-Meyers Norris Penny) noted that collaborations are needed and a processing facility (Cariboo Region) was not viable.[h]

The climate change and adaptation issue remains as one emergent area that will require more work and research to advise farm investments and production activities. Work on the regional climate change issue indciates that Quesnel will get more growing degree days and therefore more crop production potential, assuming warmer days and adequate water.[i] The climate chart below shows the historical temperature trend. The plant yield response-temperature curve is also noted. As Quesnel gets warmer (expected), more crop opportunities should arise and growing days may also increase.

Figure 7- Temperature Curve (Growing Degree Days)


Figure 8- Yield Response (Agronomy 212, Iastate.edu)[j]




[h] Note: the Steering Committee thought it should be updated. Another potential could be a small –scale, multi-species kill-chill plant.
[i] Cariboo Region: BC Agriculture & Climate Change, Regional Adaptation Strategies
[j] Growing degree calculation, example when organism growth predominantly under temperature control

It is noted from several of these regional studies and the data highlight that the North Cariboo region has many small-scale farmers and part-time farmers. This structure can be seen as an advantage to local food production and local market responsiveness. An USA economic study reported (Mayerfeld) below demonstrates an advantage of small-scale producers to a city or town.

"*There are many economic advantages in farming on a small-scale land. Local farmers generate a local economy in their rural communities. An American study showed that small farms with incomes of $100,000 or less spend almost 95 percent of their farm-related expenses within their local communities. The same study took in comparison the fact that farms with incomes greater than $900,000 spend less than 20 percent of their farm-related expenses in the local economy. Thus, small-scale agriculture supports local economy."*[k]

This is the same theme that a number of community residents and farmers commonly indicate in their comments about regional agriculture benefits to the Quesnel region. Given this remote and rural location is far from large markets, it is hard to disagree.

Further, *"The small-scale agriculture business model is generally oriented to sell products directly to the consumers. That way, the profit that would essentially go to the wholesaler, the distributor and the supermarket, in conventional agriculture, stays in the farmer's pocket".*

Thus one can conclude higher farm incomes can be developed for these types of operations and the farm business model (small-scale and many part-time) seems to fit this region.
A USA study indicates small-scale farms and community farms are highly valued. *"A small farm:*

- *has a small or moderate physical footprint,*
- *has a small or moderate financial footprint,*
- *the farm family provides at least as much farm labor as non-family employees, and*
- *the farm family retains management control.*[l]

The usefulness of these types of farms to the community was discussed from several viewpoints.

*"Small and moderate-sized farms tend to be more diversified than large farms, and in particular, they are more likely to integrate crop and livestock production, allowing for better nutrient cycling than highly specialized farms. They are better able to rely on ecological management rather than primarily on chemical inputs to manage fertility, pests, and disease. They are less likely to engage in exploitative labor practices than large farms. And they tend to be innovators in sustainable food and fiber production"*

If this is equally valid for the North Cariboo region on economic benefits, one also must ask how are the required technical and advisory support services provided to these farm owners?

The province indicates a strategic interest for a growing and profitable farm sector based on strengthening farming and protecting farm practices. The BC Government has set out three goals for the sector under its strategy:

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[k] See https://en.wikipedia.org/wiki/Small-scale_agriculture, accessed January 28, 2016
[l] D. Bell-Mayerfeld, A Matter of Scale: Small Farms in The North Central Region, UW-Madison Center for Integrated Agricultural Systems, February, 2004

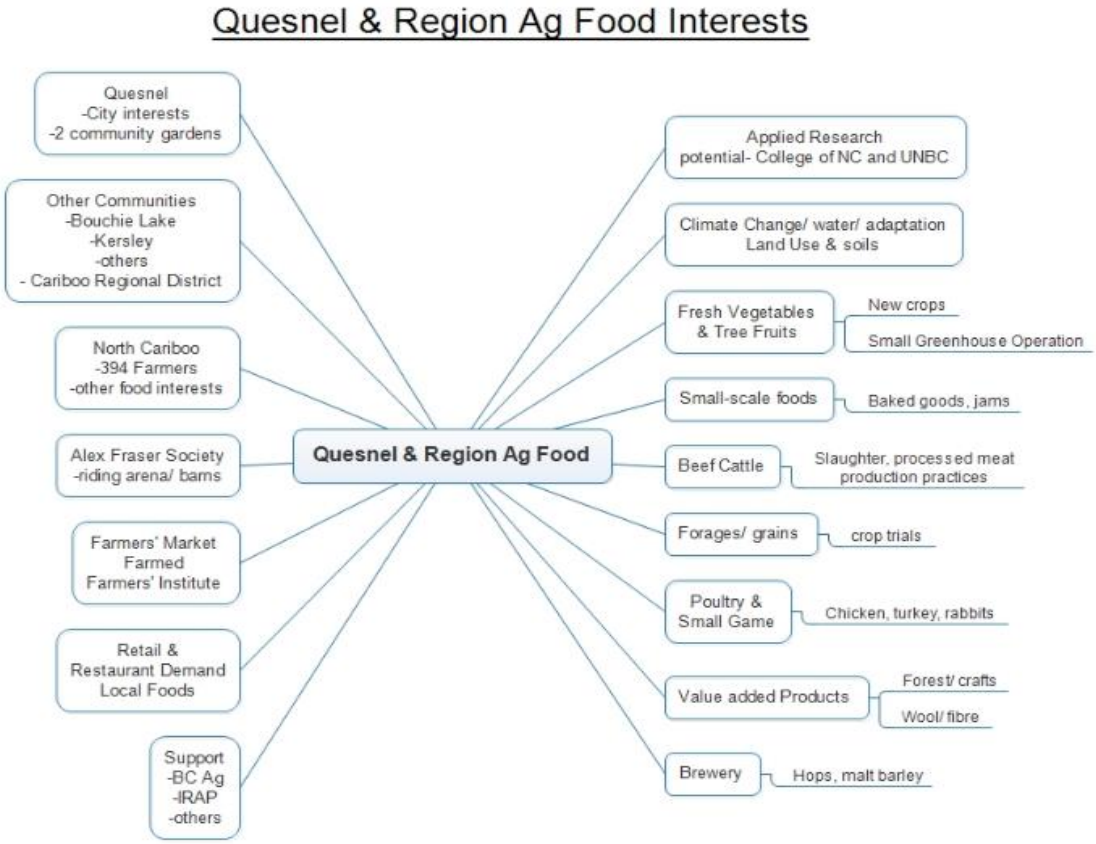
- high quality, high value products;
- domestic and international markets; and
- competitiveness.[m]

Each of these provincial goals is also important to the North Cariboo region. The next section illustrates the varied interests in the agriculture and food industry for the region.

### 4.3 Agriculture and Food Organizations in the Region

Quesnel and its immediate region have a number of agriculture and food organizations which serve various interests in the area. The diagram below provides an overview of the various interests and possible interests within the scope of the topic. As can be seen, a number of organizations are niche in focus and in numbers but some others are fairly large. This breadth helps to confirm a strong interest in agriculture production and some processing topics.

Figure 9- Map of Agri-food Interests

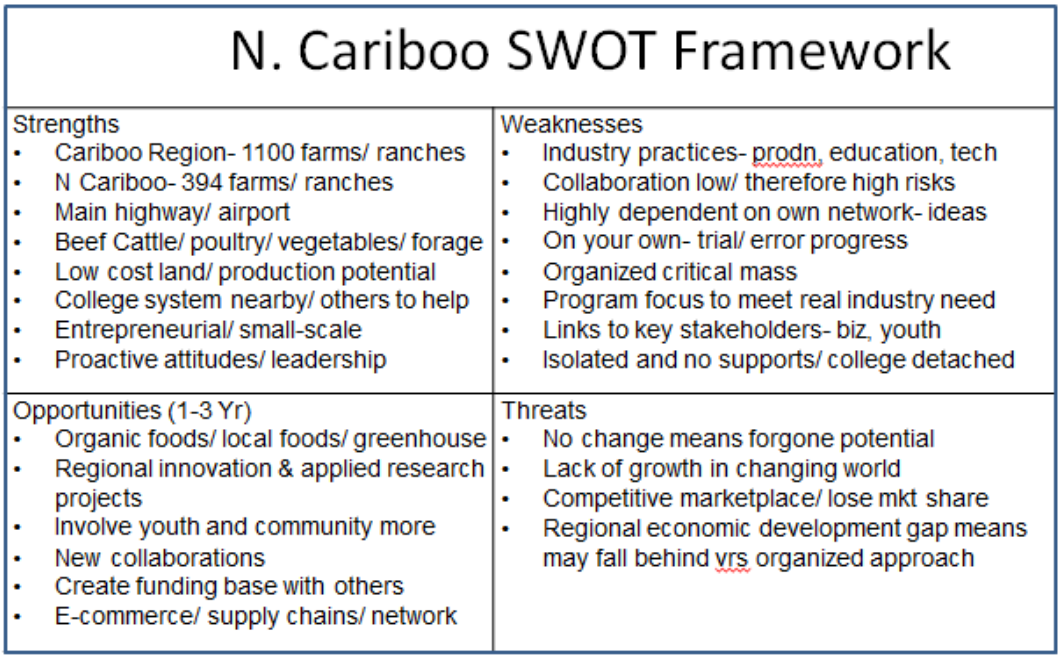



The main interests are in production topics, local foods, innovation and new crops and for some how to proceed to processing and more value-added products for higher incomes. These interest areas were explored in the community consultation meetings.

[m] See http://www.gov.bc.ca/agri/down/bc_agrifoods_strategy.pdf

A SWOT for the North Cariboo region is shown below to highlight the overview of the situation for the industry and the main barriers. These observations are drawn from the prior documents and from industry input from the region. Some of the main gaps include: lack of websites and e-commerce education and usage, a lack of marketing and supply chain linkages, production practices which may be lacking and a lack of advisory and technical supports. These interest areas were explored and commented on by attendees in the survey and in the community meetings.

Figure 10- SWOT for Region




The Cariboo region has 1,123 farms and a total farm investment of $1.4 billion (2011). The North Cariboo region has about 394 farms (Statistics Canada, 2011) and most are small-scale and produce beef cattle and mainly grow market- related crops (cereal grain and forages). The average farm size is 354 ha (780 acres), has $49,248 in annual revenues and an investment of about $1,254,308 (Statistics Canada, 2011 for Cariboo). Using the above data, one can surmise the North Cariboo region has annual farm revenues of about $19,403,885 and invested capital of about $494,076,000. Table 1 below shows the breakdown of the farms in the North Cariboo region.

Table 1- North Cariboo Region Farms

| Quesnel Data | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Beef | | | | Other | | | | | Other | | | | | |
| Area | Cattle | Hogs | Poultry | Sheep | Animal | Oilseed | Veg | Fruit Tree | Greenhouse | Crop | Totals | Area | | | |
| A | 40 | 1 | 1 | 5 | 28 | | 2 | | 7 | 46 | 130 | South, Kersley area | | | |
| B | 31 | | 2 | 2 | 38 | 1 | 1 | | 2 | 51 | 128 | northwest – Bouchie Lake/Parkland | | | |
| C | 9 | | 2 | | 9 | | | 1 | 1 | 12 | 34 | northeast, Cottonwood, Bowron, Barkervi | | | |
| I | 39 | | 2 | | 17 | | | | | 44 | 102 | Nazko, Kluskus, Blackwater | | | |
| Total | 119 | 1 | 7 | 7 | 92 | 1 | 3 | 1 | 10 | 153 | 394 | | | | |
| BC | 3166 | 83 | 1191 | 604 | 4184 | 271 | 912 | 3367 | 1934 | 4047 | | | | | |
| % of BC | 4% | 1% | 1% | 1% | 2% | 0% | 0% | 0% | 1% | 4% | | | | | |
| | | | | | | | | | | | | | | | |
| Source: Statistics Canada, 2011 | | | | | | | | | | | | | | | |

Some considerations are worth reviewing. Annually, in many other industries and agri-businesses, an annual amount of 1% to 2% of gross revenues is allocated (generally) for production improvements, innovation, applied research and education on new products/ R&D projects and so on.[n] If 1% was used, then the North Cariboo region should have an amount in the order of $194,000 and at 2% would be $388,000 annually. (It can be argued that some of this investment may be provided by federal and provincial government in a "trickle- down" effect and from other global knowledge pool sources. However, these really are not adapted to local conditions and the specific farm needs.)

In spite of this indirect support and technology transfer, direct resources and funds at a local level are also needed. The scope of the annual investment needs to be enough to provide a critical mass for accomplishing certain growth and innovation goals for farmers and rural entrepreneurs.

### 4.4 Quesnel Community Input and Comments on Agriculture Needs

A series of community meetings were held on January 21 and 22 in the Quesnel region with local farmers, agri-businesses and other interested citizens. The findings on the main themes are noted below. The detailed meeting and online survey comments are given in the attachments. The three meetings with the communities were held on an open invitation basis and were well attended. An online survey provided 24 responses. The meetings were:

- Quesnel City Hall- 14 people;
- Kersley Hall- 38 people and the Farmers Institute;
- Bouchie Lake- 8 people; and
- Total attending- 60 farmers and interested stakeholders.

The general comment themes are noted below.

1. What are the main strategic opportunities?
   This discussion revealed a number of themes including:
   - Beef cattle (7)- the need for markets, processing and more production;
   - Forages- production and yield and crop variety trials;
   - Vegetables (9)- the region was noted to be very good for soil, water and low cost;
   - New soft fruit crops- strawberry, Haskap berries and other crops;
   - Hops and malt barley for the local brewery;
   - Greenhouse crops and backyard gardens for local food use;
   - Coordination among current regional groups on events, speakers, etc;
   - Technical information and knowledge on crop production and new varieties;
   - Need for shared space for meetings and events;
   - College role as a support for community efforts;
   - Community gardens and local food for domestic use;
   - Food processing where possible;
   - Past production in potatoes, vegetables and other crops which the region has produced;

[n] The annual level can be much higher at 20% for computer software and related electronic devices and for other high science innovations.

- Need for more young farmers and new entrants into the industry;
- Succession planning for older retiring farmers and agri-businesses;
- Food production for out of region consumers;
- Exporting and international marketing of products;
- Use of online information and adapted to local conditions;
- Strengthening the local organizations;
- Use of the Alex Fraser assets and the CN College assets;
- Education and awareness- for farmers and for citizens on local foods;
- Water use and climate change effects.

2. What are your top ag/ food interests?
   This question was more focused on individual interests, including:
   - Strawberry and soft fruit crops (how to grow?);
   - Hops- new trials and malt barley;
   - Vegetables- both field and greenhouse;
   - Community gardens and local food;
   - Forage and grain production for livestock use;
   - Livestock (mainly beef cattle, also alpaca, poultry, rabbits);
   - New crop opportunities;
   - Leasable land opportunities for expansion;
   - Processed foods- not sure what types but likely baked goods, canned products;
   - Use of community kitchens.

3. Who is helping you now?
   This question indicates a large demand for knowledge sharing and information as no local resource now exists. The closest BC Agriculture representative is in Williams Lake and is not really available for individual direct farm meetings. The key information or learning sources for farmers noted were:
   - Personal farm friends and local personal or industry networks;
   - Individual trial and error;
   - Farm associations such as the BC Cattlemen's, Forage Council;
   - Internet websites and mainly USA sources, although BC Agriculture has some information;
   - Print sources- farm and industry magazines;
   - Local agriculture and food organizations which bring out speakers or which create their own information and share expertise;
   - Ag-Hort LEAP program which did run for a number of years but was stopped.

The knowledge gap is noticeable and the thirst for new and innovative ideas and improvement can be addressed. It is odd that the College is local and has essentially no role currently in agriculture product ideas and in related innovation activities.[o] Innovation centres in other jurisdictions typically will have a college to train new students and adult learners as post-secondary institutions can have a pronounced role in regional economic development. This is discussed later below.

[o] Other colleges and universities do offer these programs within the applied research mandate, such as Olds College, Grande Prairie Regional College and University of Fraser Valley.

4. What is your idea of an ag centre concept?
   The role, functions and goals of an agriculture centre were discussed by the attendees. Many people were quite clear on the core roles:
   - A person (professional/ experienced) who can help in gathering technical information and showing how to adapt research/ ideas for local conditions (31);
   - Centre of education for new entrants and people looking for new opportunities;
   - Helping build awareness of local foods and agriculture;
   - Technical information, knowledge and local professional advice;
   - Demonstration farms in the area;
   - Crop trials and production advice;
   - Shared meeting space;
   - Coordination and communication- to farmers and for consumers;
   - Master event calendar and awareness of speakers;
   - Geographic scope- to focus first on the North Cariboo region and if possible to assist others in Prince George and Williams Lake;
   - Leadership in the development of the agriculture and food industry;
   - Building awareness of the region's assets- good climate, low cost land, water, highway access and other production related essentials;
   - Public- private operation;
   - Main goal to provide education and assistance to farmers on a variety of production and marketing topics;
   - Support for the small-scale and part-time farmer.

Discussion of Priorities and Interests

The community meetings were highly productive with 60 people attending. The online survey had 24 responses (some may have attended meetings also). The reduction of the BC Agriculture Agrologist position (meeting comment) and the change in the college support to agriculture and horticulture has reduced access to local knowledge sources. However, the agriculture sector can become a supplemental economic base for higher incomes and for community sustainability.

A need for advisory production and marketing services is exhibited given the demand for local foods, an increasing interest in fruit and vegetable consumption and the strong interest from dedicated farmers and local organizations. Community interest is seen to be very strong from large and small farmers and small-scale food processors. The priorities are seen to be: need for a local agri-professional, access to production knowledge and advice, vegetable and fruit production, beef & livestock processing, access to land, and topics on sustainable production and processing. Land use and climate/ water are also interest areas for sustainable production practices.

Some of the key issues that follow are:

- What will an agriculture centre focus on and who will be served?
- How do municipal and provincial governments support it?
- How is it organized and where will be located?
- Who will be targeted and served, and what is the potential demand?
- How will it be financed and what programs should be offered?

# 5 Overview of Agriculture Centres

Increasingly, rural communities need to become more innovative and embrace creating value in their region's natural resources. It is becoming increasingly clear that innovation, technology transfer and a base presence of knowledge and service providers within rural regions is critical to the survival of the rural economy and rural communities. Without these innovation "factors", rural BC communities (and the Quesnel region) will be increasingly challenged to grow and or remain competitive in the global economy. An additional shift is the focus from "trial and error" advancements to being part of planned innovation approaches and using innovations from the global knowledge pool to create new products and market opportunities. It is critical to understand this change- now more than ever.

Innovation and technology transfer is important to rural BC and the Quesnel region. Innovation helps to define market needs and requirements clearly for business and farm owners and provides new opportunities to act upon. Technology transfer and adaptation to economic, market and technology changes is always needed. The new business concept must include a process of applied research, innovation and a source of ideas for testing new products in a region that has no support currently.

Specialized agriculture centres exist in other provinces and jurisdictions and an overview of several help to guide development of a new agriculture centre in Quesnel. The ones reviewed briefly below include food development centres, college co-located centres, and farmer directed applied research associations. Other community-based models also exist.

## 5.1 Food Development Centres

Canada has a network of food development centres which are located in the province. Canada has about 20 food development centres with a variety of ingredient, and food product areas. Each centre has technical staff, boardrooms, food processing equipment and business incubator space. They are federally certified to allow for contract manufacturing for product sales and for new entrepreneurial product developments. See http://www.foodtechcanada.ca/members/Our_Members/ for a listing of the food centres and services offered by each centre.

Alberta has a Leduc Food Development Centre (about 15 staff, near Edmonton) which offers product development, consumer taste-testing, ingredient reviews and has a small-scale incubator for early stage food businesses.[p] Saskatchewan has a food centre in Saskatoon which also offers similar professional services for its food industry. Manitoba has a centre at Portage La Prairie and Ontario has a food development centre at Guelph. BC has some local food policy development efforts led by Kwantlin College. See http://www.kpu.ca/isfs .

Food development centres are managed by a manager with technical and professional staff to support specific research projects. Often special equipment is located such as processing, packaging, formulation and testing, and analytics. They are usually part of a provincial department

[p] Incubators are shared space organizations operated to help a small new venture to grow. They can offer assistance in below market rent, shared equipment/ offices, business planning advice and other mentoring services.

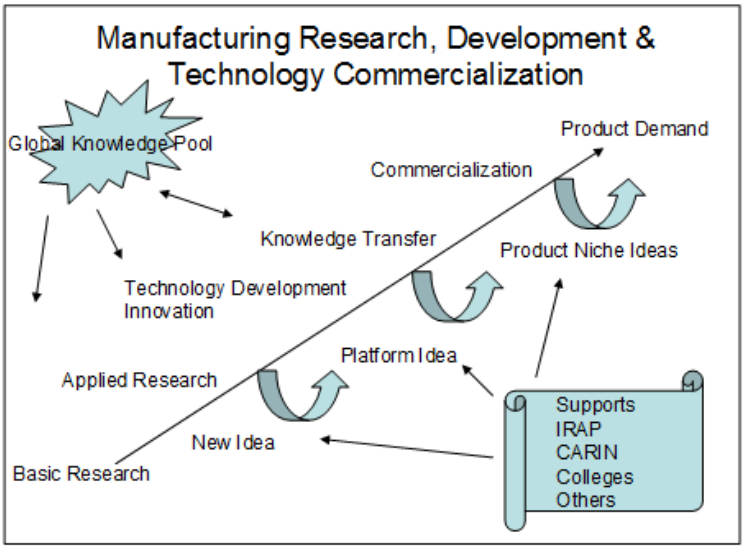
or federal department. They will often charge on a per day or per hour basis for technical support and equipment use. Usually they have cost-recovery in the order of 25- 30% of operating costs.

Small-Scale Food Canada (SSFC) is an association of growers, processors and food suppliers. Biomex is a BC-based company which is selling community food analysis lab and in-house lab testing services for the food industry. It can provide a self-contained lab (10 ft x 12 ft room) with some equipment needs for testing a number of common food risk areas. It may be relevant for food processors which have product testing needs in the region. See www.ssfpa.net

### 5.2 College Centres in Applied Research

Colleges are becoming more involved in applied research and for good reason as they are well connected with industry and businesses can work with them on specific product ideas. Product design is an extremely critical step in creating a successful product with final customer acceptance. Products build revenues for companies. Product design considers manufacturing equipment and specification needs, customization aspects, environmental "friendliness" as well as customer requirements of functionality, utility, cost and quality. Products often have "*life cycles*" and can be improved upon with technical improvements or built directly from a novel idea. The "*life cycle*" means how long sales can continue until a competitive product emerges. Products can be created in many ways. The R&D and technology commercial path will involve much research and applied research within the chain of innovation.

Figure 11- Applied Research Path (Toma)




A common challenge to farmers and businesses (same as with manufacturers) in new ideas is moving from idea concept to commercial sales (as noted in the diagram). Risk of failure can be high and colleges and public labs can help in overcoming the "death valley gap" (moving from idea to real income and commercial sales). This is a common problem for new product starts.

Trends Affecting Colleges- The post-secondary college system is dynamic and continually

improving as a result of local and national issues and have relevance to the Quesnel region.[q] Some of the overarching trends noted for the college system include:

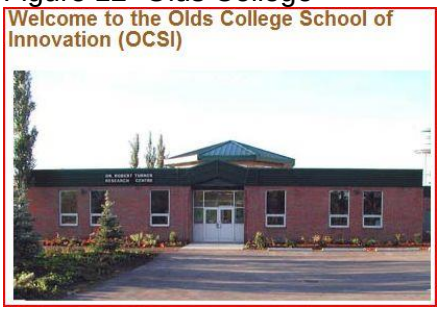
- Some colleges are moving to university status and applied degrees;
- Programs are changing to reflect the market needs for adult education;
- Colleges are developing more market–based programs and services and applied research;
- The federal government has increased funding for college-based research through NSERC;
- Student focus continues as the core focus but a greater role in applied research;
- Need to increase the use of e-technology and other new approaches of engagement;
- Demographic issues, both internal and within the community;
- Redefining the college role in the community.
- Globally a renewed emphasis appears to exist on product and process innovations;
- Regional models in economic development are commonly being developed;
- Resource conditions in the community will help determine the approaches used; and
- Colleges are innovating and some are collaborating with businesses.

Currently the college and University systems are also facing new competition for distance learning from MOOCS delivery (massive open online learning) for free courses from many leading universities.[r] This trend of knowledge-building allows for access to global information but does not assist local businesses and famers in technology adaptation and transfer. This trend will continue and remote and rural research gaps will continue to grow. One of the trends has been for more applied research and support for local industry needs. Some college examples are noted below.

**Olds College Centre of Innovation (now the School of Innovation, Olds, Alberta)**

The OCCI is a recent and successful innovation centre to help industry and entrepreneurs develop their projects. A feasibility analysis and subsequent business plan was completed (1999) and by 2000 (10 months later) it was operating with a new CEO.[s] To date it has attracted $20 million and now is operating with staff (scientists and technical staff and special processing equipment). Funding came from the provincial government and the federal government (Western Diversification) and industry projects were cost-shared. The school now has a focus on bio-processing, bio-fuels and conducts research for farmers in agronomy, horticulture, wetlands and other areas. See http://www.oldscollege.ca/schools/ocsi/index.htm

Figure 12- Olds College




[q] D. Toma, PAg, CMC, Toma & Bouma MC, Rural Colleges Innovative Practices Review, for NADC, July 2011
[r] However, independent professional judgement and local peer to peer learning is limited with MOOCs delivery.
[s] D. Toma, PAg, CMC, Toma & Bouma MC, Olds College Centre for Innovation, Business Plan 2000

**Centre for Research and Innovation (CRI- Peace River)**

A new focus with an innovation network in the Grande Prairie/ Peace River region is now operational. The Centre for Research and Innovation (CRI) is located at Grande Prairie College and started in August 2008. The funding for this centre came from Alberta's Rural Development Fund, amounting to $3.5 million over a three year term. The centre is located at the college as a standalone area, and reports to the VP of Administration. Some other funds have also been promised to the CRI. The College rents space for which Alberta Advanced Education & Technology has provided three years of funds. See http://www.gprc.ab.ca/community/cri. The CRI has a focus on rural ventures in the Peace region and is in a similar agriculture, forestry and oil and gas remote community region of Alberta.[t]

The top issues for regional economic development and the Alberta college system are likely useful to understand and are similar to BC. The top concerns seem to be:

- Meeting the challenges of the regional stewardship obligations assigned to comprehensive community college-without any funding;
- Addressing the need for increased ICT (information and communication technology) deployment with constrained budgets;
- Finding new ways to collaborate with other colleges, even sharing of core operations, while maintaining a degree of autonomy;
- Dealing with an aging demographic, especially in the north, and maintaining a critical mass of enrolment with a shrinking college-age population;
- Providing degree completion options for learners within the current tiered institutional structure in the north; and
- Meeting the skill needs of the economy with severely strained college finances.

**Summary**

These college centres are typically operated with a separate board of directors, a lead scientist or manager, have access to some funds, students and other college faculty for applied research projects. Funding was obtained from provincial and federal sources and fit with the innovation and applied research needs as these demands were not being met from the public and post-secondary systems. A pull-back of extension by government (since about 1995) has aggravated the situation. The centres will have a cost-recovery component in operations and on a project basis and likely in the order of 25-30% of operating costs.

## 5.3 USA Ag Centres

A number of USA agriculture centres are noted below to provide some guidance on the scope and approach that can be used within a regional context and service delivery model. They tend to be highly focused on local needs, funded with local funds, volunteers and other grants and have a governing board and some staff. The science component is provided by a college or university partner.

[t] D. Toma, THE INNOVATION NETWORK, Peace Region- Operational Business Plan, 2001- 2006, for Peace Region Economic Development Alliance

**Community Agriculture Development Center (CADC, Colville WA)**

This community-based agriculture centre is located in Colville, Stevens County, in the northeast part of Washington State. This organization of local producers and consumers is also known as CADC and Community Ag. It has several main activities:

- Print a Farm to Table Buying Guide- all farm products;
- Education- seminars, workshops, articles;
- Poultry and rabbit processing unit;
- Highlight local farmer markets; and
- Local food hub and special events.

The CADC has a board of directors of 11 farmers and a University extension representative. It is set up as a non-profit corporation and serves the local community interests in education, marketing and small research projects.

**Southern Minnesota Center of Agriculture (Minnesota)**

The Southern Minnesota Center of Agriculture is a collaborative effort among South Central College, Minnesota West Community and Technical College, and the Minnesota State College and University System. The centre can provide resources based on innovation, collaboration, networking, global marketing and industry information. The institutions focus on applied research with students and businesses in providing knowledge, industry information and business development support. It hosts multiple events throughout the year that provide educational, leadership and networking opportunities for those in attendance.

This centre has four university and college partners and access to many students and researchers. It also has many business associates including banking, workforce, agricultural organizations and agri-business. See http://www.centerofagriculture.org/

**The Center for Community Agriculture (CCA, East Haddam, Connecticut)**

This centre is operated by the Town of East Haddam. The vision for the Center for Community Agriculture (CCA) is to be a catalyst for agricultural economic development; farm and land-based enterprises which generate economic, social, and educational opportunities, while protecting natural resources. The initial concept for the Center for Community Agriculture included three activities:

- Food Production/Farming (Garden plots, High Tunnels, Greenhouse, Storage);
- Food Processing (Commercial Kitchen, Storage) (This aspect was removed from the project in fall 2014); and
- Farm Incubator Business Program.

The objective for The Center for Community Agriculture is to serve as the model for agricultural economic development for Connecticut small towns with limited infrastructure and the desire to grow, while maintaining the rural character of the community. They received $431,000 US for facility space with a community kitchen, cold storage and office and other space. It has a board of directors, staff and receives grant funds. They own some property worth $585,000 US and the town bonded $476,100 of the amount. It has received about $492,000 US in grants and donations.

See http://www.easthaddam.org/Center-for-Community-Agriculture/

**John Wood Community College Agriculture Education Center (Illinois)**

The agriculture centre is located adjacent to the University of Illinois Orr Agronomy Research Center and the 191 acre Beef Research Unit. Co-location helps to provide hands-on research and practical opportunities for students. Smart classrooms, computer labs, a machine shop and a library are located at the Agricultural Education Center. It has five degrees and certificates in agriculture, agriculture business management, animal science, a beef specialist and a swine specialist. It is a centre located within the University system. See https://www.jwcc.edu/locations/ag-center/

**LSU AgCenter (Baton Rouge, Louisiana State)**

The LSU AgCenter is set up as a research and extension hub for farmers, consumers and researchers. The LSU AgCenter's mission is to provide the people of Louisiana with research-based educational information that will improve their lives and economic well-being. The LSU AgCenter includes the Louisiana Agricultural Experiment Station, which conducts agriculture research, and the Louisiana Cooperative Extension Service, which extends the knowledge derived from research in the state of Missouri. It has access to 11 departments and 20 research sites in the state. See https://www.lsuagcenter.com/en/administration/about_us/

**Maricopa Agricultural Center (MAC, Phoenix, Arizona)**

The MAC is located and operated by the University of Arizona, Phoenix. The Maricopa Agricultural Center strives to be at the forefront of disciplinary field investigations, to develop, deliver and service the best appropriate integrated agricultural technologies for all problems faced by Arizona consumers and producers. It also provides assistance to the scientists conducting their research and educational outreach programs. The MA Center provides facilities and support for extension outreach programs, but also provides support and facilities for teaching University classes and Ag-Literacy to all age groups.

The Maricopa Agricultural Center's main focus is on cotton, small grains, alfalfa, and new specialty crops that could be used to provide fibers, oils, pharmaceuticals, etc. The research projects are related to irrigation and crop water requirements, soils and crop fertility, insects and IPM management, cotton production and breeding, new crops and their uses, weed control, cultural management practices, plant diseases, and urban entomology. See http://cals-mac.arizona.edu/

**Northwest Agriculture Business Center (NABC, MT Vernon, Washington)**

Established in 2006, Northwest Agriculture Business Center (NABC) provides northwest Washington farmers with the skills and the resources required to profitably and efficiently supply their products to consumers, retailers, wholesalers, food service operators and food manufacturers. Its main office is located in Mt Vernon in the heart of Washington's Skagit Valley farm region. It has three focus areas:

- Provides business development services to farm clients;
- Connects Farm to Market to increase farm sales; and

- Identifies and creates regional agriculture infrastructure.

The mission is: "*Northwest Agriculture Business Center will improve the economic vitality of the agriculture industry within the northwest Washington counties of Island, San Juan, Skagit, Snohomish and Whatcom by providing business resources and hands-on guidance to new or existing businesses that provide value-added or innovative agricultural products or services."*

It has a 16 person board, with County representation and a staff of 8. It is funded by 16 public and business organizations. It provides business services, marketing training, publications, education, awareness to consumers and office space. It has equipment for rent and helps develop local food opportunities. See http://www.agbizcenter.org/

## 5.4 Selected BC Centres

### UFV Agriculture Centre of Excellence (ACE, Chilliwack)

The University of Fraser Valley (Abbotsford and Chilliwack) has developed an Agriculture Centre of Excellence to help the agriculture industry in regional research priorities and problems. Areas are to include: agri-business training, foods, value-added, ingredients and horticulture/ production agriculture. That project is successful and has support of $1 million from the BC Government and also many industry supporters. ACE has a focus on agri-business, production topics, horticulture and livestock. The Centre is meant to respond to trends which are driving agri-food industry changes and to help the farmers and agri-businesses in that region to innovate and understand competitive issues.[u] See http://ufv.ca/ace/

### South Cariboo Agri-Culture Enterprise Centre Society (100 Mile House)

The 100 Mile House Ag Centre is a small model with a focus on education and networking activities. It has no base funding. The Ag Centre is located in the historic Lodge building and is focused on education, knowledge-sharing and extension among its members.[v] It is led by a volunteer board, is a Society and has about 125 members from the region. It has developed a relationship with Thompson Rivers University (TRU) for delivery of education in an Applied Sustainable Ranching program. It is not funded well and mainly operates with volunteer efforts. It is important to have strong community buy-in, focus on local needs and have local government support (from some lessons learned by the centre).[w] A feasibility study was done for the centre and planned a budget of about $243,000 annually, with $5,000 from member fees and the balance from the public sector [x] Funds were planned for an agriculture support officer, marketing specialist, offices and related operating expenses.

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[u] D. Toma, PAg, CMC, Toma & Bouma MC, Agri-food Directions to 2020: Trend and Technology Drivers, for Chilliwack Ag Commission, CFSF, IRAP, UFV, May 2013

[v] An interview with a cattle rancher in the area indicates that applied research and related cattle advisory supports are needed.

[w] Interview with Ag Centre manager

[x] Stonefield Consulting, Agriculture Enterprise Development Centre Feasibility Study South Cariboo and Surrounding Region, March 31, 2009

## 5.5 Farmer-Directed Applied Research Models

Another recent Western Canada trend is in the use of farmer-directed applied research association and in smaller farmer-directed research projects. This private development is in response to a pull-back in the public sector (AAFC, provincial) is applied research in preference of other science related activities and plans.

### Western Canada Applied Research Associations

There are 22 regional applied research associations in BC, Alberta, Saskatchewan and Manitoba which was recently reviewed as part of a major research review for WGRF (Saskatoon).[y] These associations offer several different models for farmers, agri-business involvement and community supports under a non-profit structure with a board of directors and local staff. They work in a network and can take on contracts for companies and for local farmers on specific crop trials and for product testing.

### BC Grain Producers Association

The BC model is operating in the BC Peace River region and focuses on crop trials mainly. BC Grain Producers are located in Dawson Creek. This is the single BC producer research association conducting farm level agronomy work with two major field sites in Dawson Creek and Fort St John. They are serving a vital regional need for crop production. The organization has 4 FTEs and carries out many crop trials each year. They have a modest operating budget and a set of plot equipment.

They have access to 92 acres on a crop rotation basis. The organization is a bit isolated and the BC government has minimal support for the region, which has caused the farmers to provide funds via a small levy for their total equipment and research operations. They have been very active in the region since 2000 and have responded to the regional needs well. (Note: BC also has a forage association, which offers crop trials and production advice for members).

### Alberta, Saskatchewan and Manitoba

Alberta has 10 of these farmer-directed organizations, Saskatchewan has 8 and Manitoba has about 3 private and collaborative applied research groups which serve the farm industries. The associations have a focus in grains, oilseeds, new crops, beef and forages. Research priorities and local “gaps” like equipment, labs, training, finances, students for research and similar matters are of interest. These are good models to consider for local governance and priorities.

The key findings of these associations are:

- Successful producer research groups appear to be co-located (AAFC or college) and also have producer group and scientists with common interests/ goals. Co-location is a very good strategy for increasing knowledge-sharing and collaboration;
- Dedicated staff are common- (from 1-4 people, budgets average $250,000/ year, with some base funds from the province- AB- $75,000/ year). Research managers at ARAs (applied

[y] D. Toma, Fertile Ground: Agronomic Research Capacity in Western Canada, for WGRF, 2014

research associations) may be difficult to retain in some regions;
- Strategic plans, boards and management practices are used- some producer directed organizations perform better at certain tasks which relates to their plans and board/ management directions. Use of a strategic research plan, board and management training on research management and key performance indicators/ leveraging resources/ best management practices helps;
- Collaborations/ partnerships- collaborations do occur among several producer groups and more can occur. Typically, collaborations require like-minded people to focus on a common task. Co-location with a science group- AAFC or college- is also very impactful;
- Funding is from memberships, grants, contracts for specific crop trials and donations; and
- They serve a local need based on grass-roots support and direction. They sustain based on good leadership, buy-in and leveraging of resources.

Producer associations and applied research groups vary in their role and approach. Their capacity will reflect regional issues and expectations. Nearly all of these groups are involved in crop projects, and typically in extension work. The community-based model is quite powerful, varies in the scope of effort-- from crop trials, education and workshops to applied research and even publications. In addition there are some farmers who have developed smaller private efforts in crop trials and applied research to help them understand how to adapt to local conditions.

### 5.6 Summary of Best Practices and Operating Models

Based on the overview of the agriculture centre models, driving trends and our experience, the main findings are:

- The pull-back of federal and provincial extension (in applied research and direct farmer advice) has occurred. In response, the college system, producer associations and community groups have developed several different farmer support models.
- Across Canada about 20 food development centres operate and are located in all provinces. The focus is on foods and ingredient use in food and functional food products.
- College supported applied research is occurring in several centres and typically has a lead scientist with a research team and students working with a research focus. Some level of wet and dry labs and equipment will be involved. The trend is for more efforts in this area as federal and provincial programs support these projects and programs.
- Regional farmer-directed research associations have also developed in response to this trend for adaptation, innovation and applied research. A recent example in 100 Mile House is the Ag Centre which focuses on education and local farmer knowledge needs.
- One of the benefits of these farmer-directed associations is that they are directed by volunteers who work in a rural community for broad-based regional projects and resulting benefits. The regional benefit may be obvious but not recognized such as direct farm leadership, higher engagement and higher buy-in potentials. However, for broad-based research more consideration of multi-site and multi-year projects should also be a goal, but for these groups, planning is really a year by year approach. Overcoming the bottleneck for those multi-year joint projects within this novel network to access their expertise and assets will be a challenge.
- Support of new crops and new entrepreneurial activities is not done by others in the region;

- Best practices include: a focus on a few specific local or regional research priorities, a volunteer board of directors, a manager and a business plan or strategy which is funded. Most organizations are societies and have collaborations with other researchers and related groups. Funding for centres requires a mix of sponsors, funders and members.

### 5.7 Assumptions for the Quesnel Region

Some of the assumptions underlying this plan and the future include:

- Canada will face continued low growth rates, low inflation and low interest rates for the near term, which likely means a low Canada-USA exchange rate (dollar) and with food imports, higher costs for imported fruits and vegetables (and other items);
- Consequently exports from Canada and foreign investments into Canada should both continue to increase;
- The federal and provincial governments will continue to see budget shortfalls and thus are likely to not provide technology transfer advice or extension for this market niche;
- The North Cariboo region continues to be underserved with agri-food innovation supports and technical help as compared with the lower mainland and south Fraser Valley;
- A public-private collaboration will be needed as the private farm industry is small-scale and fragmented with many part-time farmers;
- A community-based model is of interest and also needs to consider innovation and applied research for farmers within its service area;
- Although beef cattle and grain and forage production are the main regional commodity output, there is opportunity for new crops, improved production and sustainable practices, adaptation research and a number of entrepreneurial agri-businesses;
- The North Cariboo region is highly interested in a centre, based on the community meetings and other information;
- Others are interested in the work of a centre. The Cariboo region has sub-region cultures and ways of relating which needs to be understood and integrated for mutual benefits. This is possible but beyond the scope of this project; and
- Without a dedicated agriculture centre and accompanying programs that meet regional gaps, it will be difficult to see major advancements in incomes, jobs, new business starts and business growth. Incremental improvements may occur but a dedicated vision can accelerate progress substantially.

# 6 Agriculture Centre Options and Concept

Options and considerations for a centre in North Cariboo are noted below. Following a planning session in Quesnel more specific direction has been provided for a locally operated centre. The various aspects were reviewed by the Steering Committee (in February) to provide the general concept for the centre. The technical feasibility of creating a new agriculture centre is highly possible and has been done elsewhere many times before and in several business forms. The market for the services and programs appears to exist given the community meetings, direct interviews and other prior studies which confirm a continuing gap in the North Cariboo Region. The programs, services and financial aspects will need to be further confirmed in a business planning process with funders.

## 6.1 Concept Overview

The centre is a new proposal for the North Cariboo Region and is in a developmental stage. A transition to initial startup operation can occur in 2016. The expected activities over the initial months and first operational year include:

- Recruiting a founding Board of Directors (likely from the current Steering Committee);
- Securing funds/ resources/ agreements to meet the business plan goals;
- Developing partnerships and alliances to help accomplish mutual strategic goals;
- Completing a number of client- driven projects, based on their gaps and needs; and
- Defining a longer term business plan with performance measures.

The high level concept should be confirmed (with the founding Board):

- Centre- Vision mandate and scope;
- Governance and staffing;
- The centre name agreed to (in a committee meeting) was Quesnel & Region Agri-Food Innovation Centre (QRAFIC). The name reflects the focus and the centre can offer help to many farmers, processors, possible farm investors and other parties;
- Programs- education, applied research, community, members;
- Financial plan- capital and operating costs and funding potentials (cash, in kind); and
- Schedule and timing for a possible start-up.

The feasibility of the concept for an agriculture centre appears to be valid (well received) but will mean development work in the first year of operations with support from the community and local government leadership. The scale of operations and funding/ resources will help determine the potential programs and outcomes. The focus of the proposed centre is on agriculture, small-scale foods, and related entrepreneurial rural and regional businesses. The scope of response will be in the North Cariboo region.

The new concept will certainly support the main three goals of the BC Agri-food and Seafood Strategy: increasing production, driving competitiveness and building markets. Quesnel & region specific strategies will need to be developed in the overall strategy and plans and can tie into these provincial goals, using partnerships, innovation and improved practices for enhanced marketing and economic (income) growth. A centre can help be a platform for economic development and community strengthening in the agri-food industry.

## 6.2 Legal Form Options

A number of options can exist for an agriculture centre. Options for the proposed centre include:

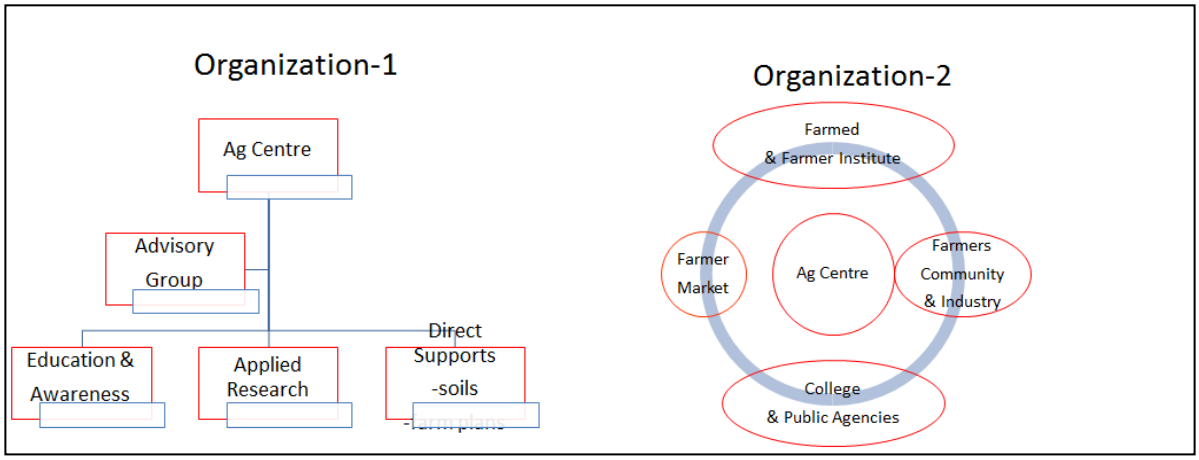
- No legal form;
- Society with members and associate members
- Incorporated non-profit;
- Co-operative; and
- Program of municipal government or college.

There are a number of considerations in choosing an organizational form that can succeed. The North Cariboo Region is somewhat entrepreneurial in nature with small business and farms which have many interests. It will be important to anchor the organization with a more mature organization, at least initially to help it grow and become sustainable. It will need to be business-led and community-oriented to help build the grass-roots support that is needed.

An organization model is needed given the direction of the Steering Committee and meeting input. A society is fairly open and can be directed by members for local priorities. An incorporated non-profit is also possible but is limited with fewer members allowed. A co-op is also possible but co-ops are both loved and hated as business models. They operate with one member having one vote and often are social enterprises. A final choice is a program of a local government or college which may be judged as too internal.

The general organization and relationships are noted below as guided by the background information and community directions. The second diagram is the target user group (and can be added to).

Figure 13- Organization Forms: 1- Centre Functions and 2- Possible Stakeholder/ User Groups




Given that the longer term view will be needed, it is suggested that a new society or association be created for the centre, with the ability to have members and grow as the regional need requires. The organization can be set up with members, associate members, and partners and this will help to create a clear user group for the centre. It will be very important to rapidly build a member base (user group) with say at least 75-100 people and the foundation for a mail list.

## 6.3 Guiding Principles

The plan below is based on a number of guiding principles including:

- Locally led and responsive to regional and community/ agriculture/ food needs and gaps;
- Sustainable in focus and resources;
- Leverage centre efforts with allied organization's for mutual benefits through collaboration;
- Avoid duplication with others in the community and region;
- Provide leadership on agri-food gaps and barriers and access to local and new knowledge;
- Partner with the local government and local communities; and
- Provide the region's citizens benefits through public good value.

Vision for the centre- the draft vision can be:

"*Quesnel & Region Agri-food Innovation Centre serves the region on agriculture, food and allied new entrepreneurial products by providing production advice, applied research, information products and building networks of local and new knowledge."*

This vision will need to be confirmed. It is noted that the Ag Centre in 100 Mile House plan and the Beyond The Markets proposal was to rely heavily on public funds and was very focused on extension and event activities. This centre is expected to be somewhat broader than that need.

The centre's intentions should align with today's budgets. The Canadian Government budget 2016 has a renewed focus on innovation and industry cluster developments. IRAP (a federal program) gets $50m more nationally and BC may get say 8-10%. IRAP is relevant to the agri-food innovation area which the Quesnel concept is attempting (in addition to technology transfer). It should also tie in as a possible innovation cluster project. In addition the feature of the agri-industry working with College of New Caledonia is a proven evidence-based development model (as noted herein).

## 6.4 Location

Location of the centre should be in Quesnel as it has a number of available offices and partners and is located centrally in the North Cariboo region. The concept of an agriculture centre appears to be well received by the user groups and community. It will mean development work in the first year of operations with support from the community and local government leadership as needed.[z] The main location can have satellite sites (and other partnerships) and demonstration farms attached to it as the local need is recognized and then developed. Demonstration farms and sites are a powerful tool for adaptation research and transfer of ideas on a peer to peer basis.

Three locations were suggested as possible:

- College of New Caledonia- has greenhouse, community kitchen, offices, staff, students;
- Community Futures Corporation- has offices and meeting rooms; and
- Possible City Hall office space- can provide offices and meeting rooms.

[z] Local government includes The City of Quesnel and The Cariboo Regional District. The benefits will flow to people in both of these areas.

From the Steering Committee discussion and review, the primary preferred location is the College of New Caledonia Quesnel site (has two greenhouses and land) and is nearby to the Alex Fraser Society grounds. It will be highly beneficial to engage students into the agriculture and food growth plans and the community where possible. The final location will need to be reviewed for capital/ operating issues and confirmed (the college is interested).

### 6.5 Funding Sources

Funding requirements will mean an investment (capital and in-kind) for base operations from local government and related public agencies, with a funding plan to secure and encourage other funds. This aspect is discussed in the financing section below. Another consideration is the business form for accessing funds for projects and for any ongoing programs. For accessing any public funds, one needs a legal organization to contract with and thus a society or an incorporated non-profit will be needed. An independent approach is also a better way to encourage community and member support. The organization can be set up with members, associate members, and partners,[aa]

**Financial Plan and Funders-** A number of funders can be approached for support and the list below is a summary of the possible funders for start-up and project funds. It is not feasible to expect a fully self-sustaining centre given the findings and analysis below.[bb]

Possible sponsors and funders (all TBC) include:

- City of Quesnel-grant writing, start up support, other in-kind;
- Regional District-possible up to $23,000 and a longer term role;
- College of New Caledonia-greenhouse, camp kitchen, science staff/ networks;
- University of Northern BC-role in science support and other capacity/ networks;
- Northern Development Trust-possible up to $250,000 (capital, training, projects);
- Community Futures Corporation/ Western Diversification-workshops and projects;
- Member/ workshop fees and farm association supports;
- Climate Action Initiative;
- Cariboo- Climate Beetle Action Committee-possible up to $150,000;
- IRAP-industry research projects and SME capacity support program;[cc]
- BC Agriculture-Growing Forward II and JTST and other BC departments;[dd]
- Investment Agriculture Foundation of BC;
- Federal innovation funds for college applied research projects;
- British Columbia Rural Dividend Fund; and
- Corporate and community sponsors.

Potential funders have not been contacted and will need to be confirmed on their commitment and specific interests. Their concerns on related issues and programming for economic development and other agri-food matters will be useful to understand. Independent assistance may be needed.

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[aa] Some public funders such as IRAP and others require an incorporated body to contract with in providing their services to the end user group- of incorporated businesses (SMEs) for some programs.

[bb] Other comparable centres typically see 25% (or lower) to 50% of funds from the private market/ user groups. This aspect needs to be validated with an operating history.

[cc] IRAP-Industrial Research Assistance Program of the Canadian government

[dd] JTST-Jobs, Tourism, and Skills Training

## 6.6 Centre Financial Business Plan

The new centre needs a focus on core areas for action and will depend on the final internal and other collaborative resources that can be applied to the mutual efforts. It is assumed the Steering Committee and the City of Quesnel will provide initial leadership on the centre. The centre will go through a development cycle of start-up, establishment and then stabilize at a level of operations. The priority areas noted were: a professional advisor, vegetable and fruit production, beef processing, access to production/ processing knowledge and applied research projects (see page 21-23 and attachements).

### Start-Up Costs (First Year)

For start-up, the centre will need a founding Board, a qualified manager (leader) with an office, some base marketing materials and operating funds. A start-up budget can be developed from the hard costs (estimated before HST) as in the table below. Personal are in the operating budget.

Table 2–Start-up Costs (Estimated)

| Item | Budget | Comment (Estimated) |
|---|---|---|
| Office | $1,500 | Desk/ chair/ file cabinet; plus rent-est $3,600/ yr |
| Computer/ etc | $5,000 | software/ printer/ smartphone; plus annual communication- $3,000 |
| Website/ | $10,500 | Identity, website, some brochures |
| Professional Support | $15,000 | accounting, legal, other project start-up assistance |
| Total one-time | $32,000 | Annual costs in operating budget below |

In the first year the centre will need to register a name, obtain funds, develop the Board, hire a manager (professional with experience), locate an office, build the identity (website, business literature, brochure, services), and get established. It should work with the college/ public sector and community agriculture and food organizations in the region to develop its final agenda for action. The core ideas are presented below but it does need to be confirmed as timely and relevant based on final funding (by the founding Board).[ee]

### Centre Operating Budget and Focus Areas

The centre will need to implement an operational plan that meets local needs and provides value for members and funders. The first year may include some event programs which can be delivered by the centre manager and with Board assistance. The centre will need to operate several core programs for the farmers and food processors in the region. The centre needs to involve the main associations (FARMED, Farmers' Institute, Farmers' Market, and other community groups) and farmers directly (as is possible). It will be important to do some planning early on mutual events

[ee] It is noted that competitive concepts can arise and when sent to a public fund, will be questioned on the duplication and need. The Beyond The Market provincial program has a strong emphasis on several areas which may overlap for example in education. It will need to be monitored.

and any other joint projects. In addition the centre can complete 1 to 3 applied research projects annually that are deemed important for the region.[ff]

The overall budget plan is noted below in table 3. Table 4 which follows shows more detail on the budget costs. The priorities for a professional advisor and the allied farm production and marketing program areas are taken from the community and industry input, and from our experience. The objective of the programs is to build local farm knowledge and capacity in production, processing and marketing topics from a structured and independent source (Agri-food innovation centre).

Table 3- Centre Budget Plan

| Quesnel & Region Centre | | Year-----> | | | | | |
|---|---|---|---|---|---|---|---|
| Projected Costs | 1 | 2 | 3 | Total | Comment | | |
| 1. Start-up | | | | | | | |
| Desk. Computer, phone | 6500 | | | 6500 | Furniture, cell, laptop, printer | | |
| Identity/ Website | 10500 | | | 10500 | Website, bus. ID + fact sheets | | |
| Professional support | 15000 | | | 15000 | | | |
| Start up Total | 32000 | | | 32000 | | | |
| 2. Operations | | | | | | | |
| Staff+operations, rent | 78600 | 78600 | 78600 | 235800 | Manager from $55k to $65k/yr | | |
| Annual review/ reporting | 5000 | 5000 | 5000 | 15000 | Accounting, legal, consulting | | |
| Operation Total | 83600 | 83600 | 83600 | 250800 | | | |
| 3. Projects | | | | | | | |
| Workshops-3/yr | 3000 | 3000 | 3000 | 9000 | 3/year- spring, summer, fall | | |
| Demo vegetables/ greenhous | 30000 | 30000 | 30000 | 90000 | With CNC | | |
| Applied Research Projects | 20667 | 20667 | 20667 | 62001 | With CNC | | |
| Strategic Projects | 43000 | 43000 | 43000 | 129000 | With researchers/ consultants | | |
| Consulting assistance | 10000 | 10000 | 10000 | 30000 | For projects | | |
| Projects total | 106666.7 | 106667 | 106667 | 320000.7 | | | |
| Grand Total | 222266.7 | 190267 | 190267 | 602800.7 | | | |
| | | | per year | 200933.6 | | | |

The table below outlines the cost inputs (before HST) of the three year plan and are estimates for the organization assuming full operations within an early start-up and confirmation phase. These items can certainly change depending on the validation and with funder comments.

A priority on vegetable and new crops was voiced in the meetings. Another priority was in beef-forage production and in processing and marketing. Information on local crop practices and production knowledge and in crop trials (and economics) was also noted. Climate change and water was noted for sustainable farm production practices. A major theme noted was for a local professional farm management advisor and a way to support and build the local capacity for agri-food growth opportunity. This is the rationale for the general program design.[gg]

[ff] Sharing of member lists early on can greatly improve success in awareness

[gg] Page 20 has a listing of the farm types: crop-153; beef- 119; other animal- 92; greenhouse-10; sheep/ poultry 7 each and so on.

Table 4- Summary of Program Budget Estimates for Plan

| Fund or Project Area | Scope and Intent | Budget Estimate |
|---|---|---|
| Manager/ Professional support | Professional Agrologist - level position- leadership, extension, advisory service. Dedicated professional with access to industry networks. Assumes a three year contract for staff; own car and rented office. | Annual- $50,000-65,000/ yr; 10% benefits plus travel/ expense budget- $6,000; office/ comm- $6,600 |
| Identity/ Education/ training | Website, business literature, cards, fact sheets/ database, workshops on local foods, production agriculture, vegetables, soft fruits | Website- $5,000; brochure/ cards- $3,000; fact sheets- 5 at $500 each- $2,500; total $10,500; Education project- workshops- 3 at $1,000 each; total $3,000/ yr |
| Demo Vegetable & Greenhouse Project. Can involve community gardens and Farmers Market | At CNC- with the current greenhouse, focus on local foods- vegetables. Assumes staff time plus supplies with annual field days for community and industry growers. CNC has indicated they received a recent greenhouse research project approval for upgrades and they are interested. | Year one- $30,000 (staff and materials)<br>Year two- $30,000<br>Year three- $30,000<br>Total= $90,000 |
| Applied Research Projects<br>-crop trials<br>-new crops<br>-crop budgets<br>-climate/water adaptation<br>With area farms. | 1. Crop trials- vegetables (field, greenhouse), soft fruits (haskap, strawberry), tree fruits (hazelnut, apple), bees, hops, forages for cattle, small grains<br>2. New crops- hemp, agro-forestry. New demo fruit/ nut orchard- say hazelnut, apples<br>3. Crop budgets- beef/ forages, vegetables, fruits, others; organic and conventional<br>4. Marketing/ market research- opportunity cases<br>5. climate/ water/ soil adaptation- 3-4 sites with CNC lab access for soils analysis | 1. Crop trials- $5,000 x 3 crops<br>2. New crops-$5,000<br>3. Crop budgets- $3,000/ crop (4)<br>4. Marketing- $5,000/ crop (3)<br>5. Climate/ water- $15,000 over 3 yrs- adaptation and practice change awareness<br>Total= $62,000 (Note: this projects area can be grown as demand indicates greater need) |
| Strategic Projects | 1. Leasable land supply & agriculture direct investment- for farmers/ investors seeking land<br>2. Succession/ Young farmers/ new farmers program<br>3. Marketing- supply/ value chain developments<br>4. Processing developments- community kitchen (CNC and community access)- cost-shared; food idea to commercialization process; beef kill/chill plant feasibility<br>5. Agriculture & food strategy- North Cariboo<br>6. Wildlife/ biodiversity/ predator research pilot | 1. Land supply & investment plan- $20,000 to develop land supply information base; help serve farmers/ investors<br>2. Succession/ YF/ NF program- $3,000/ year<br>3. Marketing- develop processing/ consumer level links for value-added products and new niches- in and out of region. $15,000<br>4. Beef slaughter review- $45,000<br>5. Ag/food strategy- $25,000<br>6. Wildlife- $15,000; total= $129,000 |

Note: will need confirmation.

This plan is about $200,000 annually and of course can be enhanced as the Board directs and the farm market responds.[hh]

[hh] From the prior centres information above, a centre should be between from $200,000 to $250,000 annually (or more-depending on the business and science plan and the Board's vision for a centre).

No special equipment is needed at this time as there is excess capacity in community kitchens, greenhouse space/ lab capacity and land for crop trials. Access to these assets and facilities will need to be discussed and agreed to. If the College is involved it can likely also access internal lab and other space. If the UNBC gets involved, greater science capacity can be accessed.[ii] The program focus above reflects the community needs which were indicated and vetted with the Steering Committee.

From the general financial plan estimates above the project requires $32,000 for start-up funds, annual operating funds of $200,000 (or slightly more) and a total three year budget of $602,800.[jj]

**Revenue Potential- Service Delivery and Project Management**

It is possible that fees can be charged for memberships, for events and workshops. If 30% of farmers get a membership this would be about 118 farmers. The fee decisions and other policy matters for the centre will need to be developed.

In addition to the above centre programs which can be delivered, the centre can take on the function of service delivery and project management for others who need some help. This can be done as a fee for service approach. Service delivery (of a regional program) can be done for provincial departments and other agencies (relevant to agriculture) with some cost charge. In addition, some regional agri-businesses and farmers may have need for a one-time project manager and the centre can provide the role on a fee basis.

The Society model provides great flexibility to fill these types of roles and the decision to proceed or not would be up to the founding Board and their operating policy. Also some policy on intellectual property ownership and fees/ contract management would be needed.

Potential revenues are noted below and will be need to be obtained from member fees, service delivery and grants. The manager and Board will be responsible to deliver this aspect of the plan. The estimates below are based on assumptions provided herein. The table shows a target number of 100 members at $25 each/ year for $2,500.

The total direct fees and revenues annually under the assumptions is $25,500. With other sponsors and events, the total revenue is estimated at $35,000 or 42% of the total base costs (staff and office). This gross revenue can be improved with a more active and market-driven centre. The Board will need to confirm the targets. Benefits of the centre will flow directly to the user groups (farmers, processors, citizens) and locally to the service and suppliers in the region. Local government should also benefit as the industry gains more profitability and growth opportunities (the two local governments are- City of Quesnel and the Regional District).

[ii] We have not made contact with this University. We have made contact with the college and it appears very favourable at this time.
[jj] Estimated based on current information

Table 5- Potential Revenues (Not Validated)

| Revenue | Target | Rate | Annual | | | | |
|---|---|---|---|---|---|---|---|
| Potential | Number | fee | Gross-$ | Comment | | | |
| Members | 100 | 25 | 2500 | 394 or more farmers/ users | | | |
| Other members | 10 | 100 | 1000 | Service and suppliers | | | |
| Project mngt | 100000 | 10% | 10000 | % of research projects or other projects | | | |
| Fee hours | 200 | 60 | 12000 | 2000 hr per year | | | |
| Total | | | 25500 | | | | |
| Sponsors | | | | | | | |
| Quesnel | inkind | | | Benefit of famers spending locally | | | |
| Regional District | unclear | 394 | | Benefit to RD famers | | | |
| Other sponsors | | | 5000 | | | | |
| Events | 3 | 1500 | 4500 | | | | |
| Total | | | 9500 | | | | |
| Grand Total | | | 35000 | | | | |
| Base costs | | | 83600 | Manager costs, reporting | | | |
| % of base costs | | | 42% | | | | |

A centre of this type can create some level of a revenue stream but it is not realistic to expect full cost-recovery as is noted in the operating models reviewed herein. It will also be important to focus on sponsor requirements (innovation, product developments, new crops, etc.) as well as local needs for information and technical advice. A balance will be needed and the centre should be piloted for a three year period as it is a new effort. Annually and at the end of the period, the key expected outcomes (centre activity, increased farm production, new sales and incomes, some innovations, customer satisfaction levels and utilization) should be recorded and reported.

### 6.7 Summary of Next Steps for Centre Concept

Some of the next steps will include: validating the final business plan (with funder input), marketing the strengths of the centre, creating the founding Board of Directors, developing a quality website for awareness, creating a target market of clients/ users, developing a program and product focus, building relationships, creating and managing within the budget, educating and communicating in the community and having strong and involved leaders. There are many things to do in a start-up of this nature.

We note some of the key findings from the research provided herein:

- People produce what they like (from vegetables, foods, beef, dairy, small game, poultry and fibre and specialty crops);
- The North Cariboo region has much pent up production capacity;
- It lacks both technical and local support for this sector;
- It has nearby access to the College and University (PSE) systems;
- There is a strong local cluster of ag/ food organizations and expressed interest; and
- Collaboration and cooperation are seen to be useful for mutual benefit.

Some of the best practices drawn from the other centres include:

- Need to focus on the region strengths and build the necessary capacity (fill gaps);
- An organized and strategic approach gets positive results;
- A locally directed and managed centre can be flexible and impactful;
- Starting small and adding scale and scope works well;
- Applied research, knowledge transfer and innovation are keys to new and profitable growth opportunities;
- Community and business engagement can be done more easily through a centre;
- New collaborations and cooperation can develop easily; and
- Building a centre allows many organizations (public and private) a new forum for joint discovery, education, economic developments and local progress.

**Board and Staff Plan**

A founding Board of Directors comprised of the Steering Committee members (and provided with initial staff support from the City and College) is recommended. A Board with 9 people should include a mix of agriculture and food producers (5), a retail manager, a regional district person, a City of Quesnel person and a provincial government person. The chair and co-chair will be selected from among the members for a two year term. These ideas will need to be confirmed.

The initial staff plan will require a centre manager and access to meeting space and an office. Other academic and technical resources can be accessed from projects supported through the centre. The manager will have qualifications: 8 to 10 years of industry experience, education at a BSc or higher level in agriculture (MSc) or sciences/ commerce, be a self-starter, be independent of any possible conflicts, understand farm management and science, possess leadership and communication skills and able to manage and secure resources for the centre. Projects will involve staff from the college system and industry experts.[kk]

**Program Plan and Targets**

The annual program plan should include a new founding Board meeting to review and set agreed plans for the year. Staff can assist and secure funding from relevant agencies and where possible corporate sponsors. Annually the cycle can include:

- Annual business plan and communications plan- August;
- Fall fair and workshop- crops/ livestock- November/ December;
- Spring get ready workshop- crops/ vegetables/ other;
- Spring- applied research plans under research committee/ CNC;
- Summer/ fall- workshop and other projects; and
- Fall- annual reporting to members and to sponsors.

[kk] For governance purposes, the Board hires the Manager who then hires others as needed for projects and operations. Board policy will be needed on conflict of interest, roles, signing authority and so on.

**Schedule of Timing**

The new centre can be decided in 2016, presuming a final business and start-up plan which can be implemented by the Steering Committee (founding Board). The centre will need other help to source initial start-up funds and in locating operating funds. It likely can be started within 6 to 8 months after a decision to proceed with the correct direction and management/ funder support.

**Critical Success Factors**

A number of critical success factors will need to exist:

- Leadership which can be independent within building the vision;
- Focus and plans responding to the local needs;
- Agreed collaboration and shared vision;
- Supportive funders;
- Farm and community buy-in and market acceptance;
- Local government support and encouragement; and
- Managed growth to the vision.

**Expected Outcomes**

It is important to consider the expected outcomes of a new centre. Some of the desired outcomes are:

- Increased agriculture production- forages, vegetables, tree and soft fruits, new crops;
- Increased local food and beverage use, sales and incomes;
- increased marketing of foods, crops and livestock out of region;
- Increased crop productivity from use of best practices and local and new knowledge;
- New farm growth opportunities and more beginning farmers;
- Recognition of the Quesnel region as a modern productive agriculture and food centre;
- New innovations brought in to the region for farmer and local business use;
- Greater economic development opportunities and visibility for the region; and
- A sustainable and exciting Ag Centre which is proactive, responsive and seen to be useful to the region's economic prosperity and growth.

As the centre develops it can increase its scale of operation and scope of reach into other nearby communities and sub-regions which also are seeking out assistance to remain competitive in a global agriculture and food marketplace. By starting with a focus and setting achievable goals, it can prove to be a highly important foundation for many other regional opportunities.

The risks to the venture are not seen to be high and the potential for success appears strong, given the business plan and supporting factors are managed. Risks always exist but can be managed if understood and planned with corrective actions. Another risk is the foregone opportunity to implement a centre of this type given the community feedback and farmer interest.

By committing to the next step of business planning and more detailed organization engagement, indicates a choice to grow and develop. These aspirations to grow were voiced by many people in the community meetings and by the Steering Committee. The feasibility appears good for a centre.

# 7 Conclusions and Recommendation

This project reviewed the feasibility of a new agriculture centre for the North Cariboo region (Quesnel & region). A feasibility study needs to assess the technical, financial and market feasibility within the concept and understanding the possible viability and community needs.

**North Cariboo Region Farms and Demand**

This region is located about 8 hours north of Vancouver and is an agriculture production region and mainly in beef cattle and forages/ cereal crops. In addition a number of specialty vegetable and fruit growers are operating in the region. A total of 394 farms (North Cariboo) have a revenue value of about $19 million (2011) and invested capital of about $494 million. The Cariboo region is reported at about 1,123 farms and revenues of $55.3 million (2011) and an investment of $1.4 billion. From the Quesnel farm community meetings and other direct interviews, it appears that demand for services does exist and owners are seeking help. The actual demand will prove out with a centre.

**Agriculture and Food Centres**

A review of agriculture and food centres was completed and many examples exist. Canada has about 20 food development centres to help in ingredients, product design, formulation, testing, packaging and other areas that are needed in pre-commercial tasks. These centres tend to be operated by the Federal or Provincial Governments. Another type of centre has emerged with colleges and universities developing and managing the centre with a regional or local focus. The USA and Canada have a number of these centres operating and in BC, the University of Fraser Valley has an Agriculture Centre of Excellence (ACE).

A third type of applied research activity (and increasing) has developed in Western Canada with farm associations. They serve local farm members, are small operations and generally complete crop and fertilizer trials. The review of various agriculture and food centres shows that the concept is technically feasible and best practices can guide the development for farm and food processor services.

**Market Comments**

Community meetings and direct interviews (and an e-survey) were competed to gain direct market comments on the farm needs and interests. About 60 people came to the meetings and another 20 people were involved in direct interviews. The top farm interests are in:

- Strawberry and soft fruit crops (how to grow?);
- Hops- new trials and malt barley;
- Vegetables (9)- both field and greenhouse;
- Community gardens and local food;
- Forage and grain production for livestock use;
- Livestock (mainly beef cattle (7), also alpaca, poultry, rabbits);
- New crop opportunities;
- Processed foods- not sure what types but likely baked goods, canned products;
- Use of community kitchens.

Who was helping farmers now? The responses varied on the key information or learning sources for farmers noted:

- Personal farm friends and local personal or industry networks;
- Individual trial and error;
- Farm associations such as the BC Cattlemen's, Forage Council;
- Internet websites and mainly USA sources, although BC Agriculture has some information;
- Print sources- farm and industry magazines;
- Local agriculture and food organizations which bring out speakers or which create their own information and share expertise;
- Ag-Hort LEAP program- now stopped.

What was needed? Responses included:

- A person (professional/ experienced) who can help in gathering technical information and showing how to adapt research/ ideas for local conditions (31);
- Centre of education for new entrants and people looking for new opportunities;
- Helping build awareness of local foods and agriculture;
- Technical information, knowledge and local professional advice;
- Demonstration farms in the area;
- Crop trials and production advice;
- Shared meeting space;
- Coordination and communication- to farmers and for consumers;
- Master event calendar and awareness of speakers;
- Geographic scope- to focus first on the North Cariboo region and if possible to assist others in Prince George and Williams Lake;
- Leadership in the development of the agriculture and food industry;
- Building awareness of the region's assets- good climate, low cost land, water, highway access and other production related essentials;
- Public-private operation;
- Education and assistance to farmers on production and marketing topics;
- Support for the small-scale and part-time farmer.

This last question shows a market gap for a much needed advisory resource to be delivered through a new Quesnel & Region Agri-food Innovation Centre. A number of organization and funding aspects will need to be developed further and tested with the community and the potential user group.

**Recommendation**

Based on the feasibility review completed herein, it is recommended that further consultation for validation of the concept be carried out. Annually funds of $200,000 will be needed over a three year pilot period. This next step will help in the decision process and allow for more assessment of the possible partners and funders to a new centre. A validation process will take about two to three months. Funding and partners will be needed. Decisions to start (and final scale) or not can be made at that time.

# 8 Contacts, Data and References

## 8.1 Contacts

Ted Armstrong, Area Rep, Cariboo Regional District
Lynda Atkinson
Sarah Barber (Bouchie Lake Country Store)
Rob Borsato
Greg Brink, Alex Fraser Society
Jennifer Catherall, College of New Caledonia
Dylan Cash, Area Rep, Cariboo Regional District
Emily Colombo, Regional Economic Operations Manager – Cariboo, JTST, Quesnel
Heloise Dixon-Warren, Moose Meadows Farms
Edgewood Farms
Fred Harder
Omer Hrbinic
Rita Giesbrecht, 100 Mile House Ag Centre
Byron Johnson, City of Quesnel
Greg Lawrence, CFC Quesnel
John Massier, Area Rep, Cariboo Regional District
Elissa Meiklem, ITA, IRAP, Prince George
Erica Nitchie, PAg, BC Agriculture, Williams Lake
George Powell (Ag For Insight)
Amy Quarry
Amy Reid, EDO, City of Quesnel
Morgan Ross, College of New Caledonia
Greg Sherstan
David Zirnhelt, Williams Lake

## 8.2 Data

Statistics Canada, Regional Agriculture Data
BC Agriculture- Cariboo data

## 8.3 References (within report body)

## 8.4 Community Meetings

Three community meetings were held and helped to identify the main interests, needs and concerns people and farmers in the region have with a proposed Ag Centre. The comments are noted below. Total of 60 people attended these community meetings.

*Quesnel City Hall (14 people)*
- we need a solid inventory of data on the agriculture and farm profile to plan things
-how can we link with others better?
-where are the funds and so on?
-we need a common meeting space
-community gardens are needed and started small and work well

-we need to include more youth and the public
-the cattle industry needs help and more education
-need research on forages and cattle
-need to increase local food and ag production
-increase the capacity of FARMED and need labor for production
-demographics and older farmers is a concern
-need consumer products and funding for projects
-need awareness of local products and new niche products
-BC Forage Council- need a manual for forage production
-need education for new farmers and a knowledgeable person
-do a LEAP program again- was very good
-the College is interested to partner and use the greenhouses
-ag centre can be a resource for all groups & help coordinate
-educate consumers on good local foods
-no communication among many groups now
-need more young farmers in the area. Need help on production practices
-need help for farmers to be profitable and grow the industry
-need a network to get information to people
-too many small groups and may duplicate their efforts
-the fall fair can be used to educate consumers and rural people
-need a meeting room for all people
-the City is taking the lead now and why is that? Where is the regional District?
-maybe use pulp mill waste on lands, but does smell
-cost of land for young farmers is an issue
-water and land access is an issue for young farmers. Can we get dairy to move north with lower cost land?
-Smithers- had a research farm and PG had one too. Where are they?
-the Centre needs to support ag and be a public-private partnership.
-a multi-use centre can help could be on a farm and educate people
-may have buildings and do need a centre on a farm
-we need help on soil capability and analysis
-need a place to collect research info for new farmers and others
-need an extension person
-beef is important and now get help through own networks
-Cattlemen and sheep federation helps
-missing information on events and a Master calendar of events can help
-vegetable, herb and fruit need help
-tackle it from food and ag – backyard food production. Community Gardens and high school can do this
-Seedy Soil- event can help educate people
-First Nations- food is a big issue
-need to access local experts as they know a lot
-Alex Fraser Park- want to develop as an ag park
-lot of farms left when extension closed. now rely on people in the room and there is no local help
-did a session on pork production- the market dried up. Is a lack of facilities here
-beef industry – go to the old timers for advice

-beef- is a big area and also need help in forages
-fruit- no local help- go to U of Sk for advice- Dr. Bob Boer
-have a local orchard- 3 to 4 acres of berries did it on our own and now it works. Need to grow more and it is trial and error
-vegetable and flowers- is all trial and error
-need to adapt to local conditions- is lots of information from organic newsletters
-Ag Centre- should be at the College and need a person for research and to review prior research and information for local use
-need tools- pamphlets, booklets, fact sheets
-need a resource person to help out
-focus on 4-5 areas; education and a website
-most needs are in information and education not a building
-need a coordinator and a resource person
-maybe a website with a news feed to other groups too
-a calendar and blog, ask the expert question, farm mentors, list of local experts
- need to collaborate for more $$ and join with other groups
-Beyond the Market- model seemed to work well- connect people and build networks
-Ag Centre should expand to Williams Lake too
-space- can go to many places in Quesnel, link with others for bigger impacts
-soils are a need, the TRU sustainable ranching program can help
-keep it small and start in Quesnel, be inclusive
- is larger than Quesnel- is Cariboo region

*Kersley Hall (38 people)*
-price of cauliflower is very high- shows a gap
-BC agri-tourism regs are a concern to watch too
-climate change- is a concern to watch and means more crop opps and land is cheap here
-need a yr around farmer market
-there is a lack of knowledge here and Quesnel is centre of the province and very good production area
-sheep and farmers markets- AB has all the processing
-need to get more local foods here
-we have fewer veg farmers and need more young farmers
-need to have profitable farms and enough to live on the farm full time
-are growing hops in the area and was trial and error as there is no local help
-strawberries- learned how to do it on our own from website and no local help
-it needs to be viable and need more young people
-Ag Centre- can be an info exchange, help on finance grants, and on new opportunities
-need workshops and speakers on crops and livestock
-can grow produce hear easily
-used to have a DA- now no local knowledge
-used to grow potatoes, vegetables, exported to Idaho
-need to stay small-scale and no expertise here on technology and advisory services, have to go to UFV
-regs have increased the cost to grow vegetables
-is a great prodn area here. Lot of older farmers and need more young farmers
-need an investment such as the brewery

-are losing agrologists in W Lake too
-have CNC and UNBC greenhouses for use
-we need this knowledge base and the skills for growing
-beekeeping is another area, can diversify with crops
-Ag Centre- can – coordinate, train, provide information, attract people, need farm related services, applied research is a key
-need applied research as UNBC is trying to do
-should gather and coordinate information for farmers
-producers do not know where to go
-main goal is to gather information, add value to it and adapt to local conditions
-lot of the early information is lost
-need help in marketing and to help the prodn capacity and share the information

*Bouchie Lake (8 people)*
-we have many small markets and niche products
-need someone locally to talk with- a local resource
-we cannot get any information typically from BC Ag
-foods- need a local abattoir, did do a study on it- but not viable
-need more local food production and small-scale farmers need help
-lot of good prodn here/ lot of variation in climate zones in the region for local prodn
-succession of older farmers- and need more young farmers
-cost of land is high
-barriers- too many volunteers and are burning out
-need to support local grass roots groups- in capacity building
-brand – need to use it
-we have local experts and need a directory
-small farmers are disappearing and Walton bought 6 ranches in the area and is a concern as they take the land out of prodn, use the land for carbon credits
-need a co-op office to consult with for new farmers and to help in farm plans
-how can we maximize prodn?
-diversification is a farm goal too. The trend is to ship food a long way and now people are going back to local foods
-when we lose the small farm locally we can lose the local economy
-here the focus is on wood, and oil and gas, not on ag prodn
-we need to focus on small farm developments
-people are interested in healthy foods, and have money for high quality foods
-need education, information sharing
-is a rural- urban divide
-have local food prodn, more backyard prodn and can teach it in schools
-Cariboo District is very large and has a good growing season and less cold than other areas
-is more growth in farming
-are new sales opps for farming now too and can have new relationships with retailers too
-needs- how do we market our produce?
We also lack local prodn for local food markets
-education is vital too, farming is not promoted as an occupation in school
-ON is doing something in schools

-we need- something like Beyond the Markets model. Was extension and coordination
-is a corridor model. Is now stopped
-need a central location for Ag Centre. Can be a resource and networking centre
-need local food solns and to grow more food
-possible- aquaponics and carbon credits
-canning- growing as a trend
-need a resource for supports, need some basic practical resources- kitchen, packaging, storage etc
-need to be self-sustaining
-funding is hard to get and will be hard to pay for it
-need an inventory of processing in the area
-need workshops and a drop I office
-QU have a large yr around farmer market
-Ag Centre- can have a business incubator, office person, biz planning
-we do not have good stats/ info on who we have now
-we have no place to post info now and old AAFC data- where is it?
-there are no bi ranching groups here
-at the farmer market- veg and bakery people do the best
-the fruit stand did work well before, had coolers etc

### 7.5 Regional Survey – Survey Monkey Data (December 2015- January 2016)

A one page survey was used to collect input and we had 24 individual forms completed. The summary of the comments is given below.

*A. Top three agriculture/ food development opportunities in the N. Cariboo region are (total responses = 24)*:

First: beef- 7; vegetables- 7; climate/ crop diversity- 1; local food- 2; haskap- a viable crop for the area- 1; local dairy products-1; being able to consult with locals who have successfully produced agriculture products for up to 4 generations; Food Security / Interest in local food & products / Community Health; farmers market; vegetable and fruit products & other root crops; high protein crops for export; forage

Second: vegetables- 2; local markets; superfood fruits; The availability of a variety of soils (land) suitable for diversity of crops. A climate suitable to a variety of crops-2; certified organic; Regional capacity of local producers to meet demand; fresh meats, hay production-2; with climate change- niche crops in micro climates; sogum has potential with new advances in growing habits; vegetables; forage for cattle; small business with value-added (Fine meats/ cheese); local fruits/ nuts; relatively close to an international airport so could produce on a large scale; Potential to increase both demand and supply of locally grown produce; We need more food producers - we are losing more all the time due to retirements; potential nut production? (unsure if climate is suitable, but blight and draught are affecting Californian crops, largest producers in North America).

Three: cereal crops; value-added; small farms with a few cattle/ sheep/ goats; animal protein and Quinoa; online sales; Water availability- both surface + ground water. With climate change a longer growing season that should allow us to grow a greater variety of crops; succession/ attracting new farmers; frozen product (meat & veggies); grain production; Potential minor businesses based on testing and quality control measures, but unfortunately we are not a transportation hub; food processing; pork; breweries; actually opportunities endless, we have water, relatively cheap fertile land, a warming trend and are situated along the main North/South transportation corridor; Potential expansion of overseas market as traditional growing areas face climate difficulties; we are losing our knowledge base. Older farmers- no replacements; cheese and other dairy; food processing and canning.

*B. What re the top agri-food gaps or needs/ issues you see in the North Cariboo? (Total responses = 23)*

First Gaps/ Needs/ Issues

-Loss of agricultural land for other uses - it is a sign that agriculture has not been profitable, but also a danger if it needs to return to agriculture
-need more marketing opportunities
-region- specific agricultural research and extension
- the need is for a current and relevant plan, done by local farmers and ranchers assisted by a credible consultant
-Improving communication and collaboration among producers
-we need capacity in order to support food processing
- education
-awareness
-need an agronomist
-experimental/ education farm
-advertising
-not having a productive knowledge network (UNBC, CNC) and a coordinator (agriculture) extension worker- agrologist
-Business-to-business sales - everyone is focused on the end consumer
-succession- older demographic
-short growing season
-slaughter facility
-lack of infrastructure/ support
-Beef Production (available crown range for grazing)
-any large scale framing
-Business development
-abattoir for Quesnel
-availability (price, store fronts)
-year round retail location

Second Gaps/ Needs/ Issues
-resources, communication
-central place/ contact person for local concerns
-apiary/ slaughterhouse
-access to larger markets
- To interpret + assist growers + producers with the applied science- not having experimental plots, test varieties etc. locally on farms willing to experiment
-Lack of understanding of the certified organic advantage
- Lack of support from local government - not Ag. Advisory Committee for CRD; reliance on volunteer groups
-loss of local Ag offices/ expertise
-agriculture program at the College
-fragmented sector – limited synergy or economics of scale
-potential dairy production
- We need to attract large producers to the area but I don't see the point from an economic standpoint
-food processing capacity
-marketing advisor
-lack of government subsidy
-access to temporary labor when needed- may be sporatic and very short term
- Anticipated increases in food costs for imported foods due to CDN drop and costs/conditions in foreign growing region
-need to recruit more young famers, land is an issue along with other start- up costs
-helping us to look beyond our existing horizons at upcoming opportunities
- local population is a little too small to support processing on a commercial scale

Third Gaps/ Needs/ Issues
-venues to sell
- better communication and education for encouraging young people to grow food
- local government funded professional agriculturist
-grants for young farmers
- A need for practical, hands on workshops, skill training, computer training- financial advice + money management
-strategic business planning
- Food Security / Community Sustainability - we are not secure nor sustainable
-no local provincially inspected abattoir
-coordinator
-public awareness/ interest
- red meat abattoir with cut and wrap as well as further processing ie. breakfast and deli sausage

- difficulties for potential local producers of processed goods due to legal restrictions/requirements
- we need to find a way to financially help young farmers get started
- articulating and connecting opportunities to investors and producers

*C. Is anyone helping to resolve these needs or issues now?*

- Total responses- 21- 11 yes; 10 no

*D. If yes, then how? Is it a free service? (Total responses = 14)*

- I believe groups like the FARMED group are trying to promote products to the public and build the awareness, and also bridging the communication gap with other farmers/producers as well as community partners.
- A bit of local action but not enough to support a wide scale initiative. (at least regional
- At a grassroots level farmers, ranchers and farm interest groups are appealing for them
- (Reason for answer No in question #3) Not to my knowledge-BC RG extension service very limited and often unable to attend local meetings to inform and explain government policy and possible financial assistance programs
- Community Futures - some free, some not Beyond the Market - does not serve Quesnel area BC Ministry of Agriculture FARMED - networking and marketing, mostly paid services, maybe some free
- FARMED / North Cariboo Agricultural Marketing Association is actively & very successful at marketing and supporting local agriculture Growing North Cariboo established a P4HC / North Cariboo Partners for Healthier Communities Committee that has the ear of the CRD and Northern Health. Many "local experts" giving of their time to support new farmers, mentorship opportunities, and experiences
- Unknown/ guessing
- I have no idea
- Farm business advisory service
- local businesses promoting local farmers. not necessarily free but included in the price
- The FARMED group and Partners for Healthier Communities Committee are looking at way to increase both local supply & demand. These and others also support new growers with information and networking support. However, there is still space to address these needs/issues by other means including facilities, political support and financial support.
- There are and have been a few university-sponsored research projects, but the results are not easily accessible to public
- I believe the city is assisting but this activity is never "free"

- Farmed helps with workshops, Community Futures brings in training programs, CNC would like to help, but is hampered by small numbers for enrollment and necessity to be cost neutral. the City of Quesnel understands that agriculture is an important economic driver in the region. I am not sure the regional district understands this

*E. Would you be interested in supporting an Agriculture Centre initiative in the North Cariboo and how would you like to be involved?*

- I support and like workshops- 14
- I support and will help in start up- 11
- I support and can help in funding- 4
- I support and need more information- 7
- I am not interested- 2
- Total responses = 24

*F. Any other Comments? (Total responses = 9)*

-Particularly interested in an experimental/educational Agcentre/farm
- A physical centre is doomed to fail. A virtual and network based centre is a better bet. Better to augment services through existing agencies such as FARMED, Beyond the Market and Community Futures than try to create a new entity. - I hear many calls for cooperative processing and storage. I don't believe there is much of a business case for this. These types of enterprises have greater chance for success as private investments or smaller partnerships. Too many cooks in the kitchen spoils the broth. - The market for wholesale unprocessed vegetables is good, and there is money to be made here without have to invest in processing infrastructure. Meat processing is a whole other story... - Too much focus on the farmers' market model. Needs to be greater focus on wholesale, business-to-business and online sale opportunities - All public investments need to target strategic, business and growth oriented farmers, not hobbyists, exiting farmers, or farm 'voyeurs'. Feedback from business and growth oriented farms (people with skin in the game) should be weighted more heavily than feedback from others. - Solutions should be opportunities that are practical, size-appropriate and achievable for individual farms. over-reliance on joint or group strategies doesn't yield a lot of quick wins - Labour is the elephant in the room. Farms with opportunities to grow will strugggle with labour limitations. There are good subsidies available to support employment generation and most farmers have no idea they exist.
- very few younger people attended meeting as earning a good living from farming is difficult-must work off farm, land is expensive
- Increasing farming is a current/popular theme. It is unfortunately useless to this community. If we are looking to attract profitable businesses then we need to think large scale. If we think large scale, then we are only contributing to the CRD tax base and that will not help the majority of the people in the

Quesnel Area. The CRD addresses issues but has no real impetus into the local economy which is what Economic Development should be focusing on. A final comment is that if we are considering large scale farming, it only makes economic sense to be located to modern infrastructure and in an ideal climate. Both are not characteristics of Quesnel. So let's focus our efforts where they should be, on highly leverage-able industries that are suited to our areas. Wood industry, mining, tourism...and make us a hub for the current market that is the fly-in/fly-out culture. This will allow us to boost our population which will, in turn, promote natural growth in our community and services and make Quesnel that much more of an attractive place to live. It is a catch- 22, but we need to add effort into the system at some point to propel the spiral forward, and I don't see farming as such as area that will lead to fantastic results.

-I may be interested in being involved in the planning and start up, however, it will depend on my schedule and availability when the time comes.

- I think this Centre would be of great benefit to the Quesnel area. We need more focus on agriculture now that forestry is downsizing (pine beetle). We need more help for young, just starting, farmers/food producers
- I am a little nervous about proposed Ag. Centres in light of what happened in 100 Mile House with theirs
- Look to Beyond the Market initiative which was held over a number of years along Hwy 16, a free service which built capacity for agriculture development. Also, the RAIN (Rural Agri-Innovation Network) out of Northern Ontario. http://rainalgoma.ca/ These solutions aren't specific to the Cariboo region, but have potential to inform a model for how it might take place. Also, there is opportunity for partnership with UNBC.

*G.* I am a: (Total Responses = 23)

- Farmer- part time- 3
- Farmer- full time- 7
- Rancher- 1
- Vegetable grower- 5
- Agriculture business supplier/ service/ organization- 6
- Food retailer/ food service- 2
- Agri-researcher/ instructor/ public sector- 6
- Finance/ insurance/ real estate with agriculture clients- 1
- Other- 9

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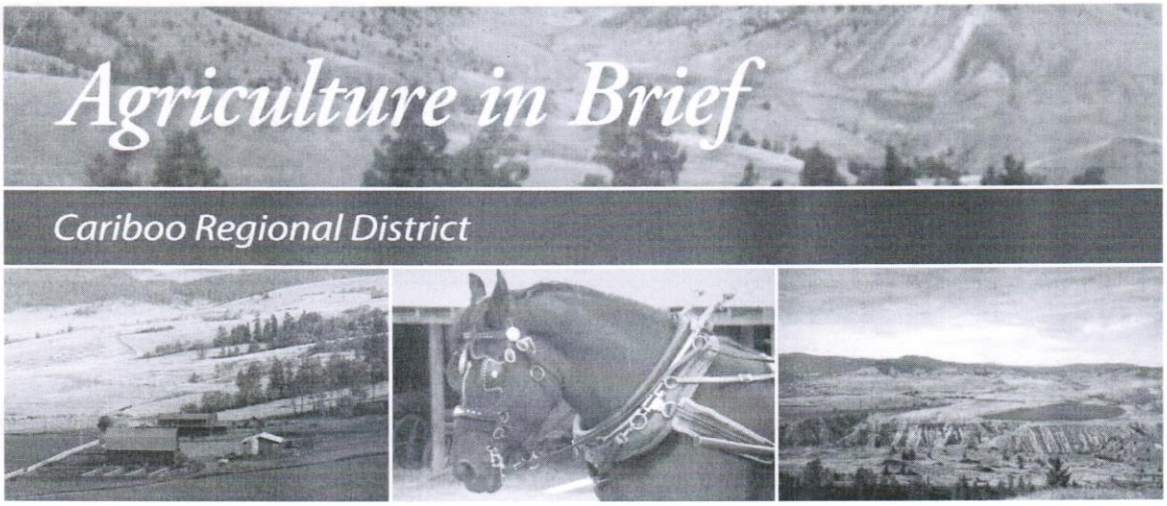
E&OE
May, 2016

Some Local Assets


**Jurisdictional Makeup**

**Member Municipalities: One Hundred Mile House, Quesnel, Wells & Williams Lake.**

| | | |
|---|---|---|
| **Population (2011)[1]** | # | 62,392 |
| **Jurisdictional Land Area[2]** | ha | 8,060,945 |
| **Agricultural Land Reserve (2012)[3]** | ha | 936,255 |
| **Population Increase (2006-2011)[4]** | # | 202 |
| **Population Increase (1971-2011)[4]** | # | 24,959 |

| Census of Agriculture Data | | 1996 | 2001 | 2006 | 2011 |
|---|---|---|---|---|---|
| **Total Farmland Area[5]** | **ha** | **423,491** | **400,177** | **486,079** | **397,793** |
| **Number of Farms** | **#** | **1,149** | **1,188** | **1,160** | **1,123** ← |
| **Average Farm Size[4]** | **ha** | **368.6** | **336.8** | **419.0** | **354.2** ← |
| | | | | | |
| **Farmland Use** | | | | | |
| Crops[6] | ha | 49,111 | 58,972 | 54,123 | 50,449 |
| Summerfallow | ha | 1,301 | 709 | 239 | 191 |
| Tame or Seeded Pasture | ha | 32,279 | 29,179 | 32,721 | 29,446 |
| Natural Land for Pasture | ha | 266,815 | 238,784 | 319,908 | 264,343 |
| All Other Land[7] | ha | 73,670 | 72,532 | 79,087 | 53,364 |
| **Total** | | **423,491** | **400,177** | **486,079** | **397,793** |
| | | | | | |
| **Crop Area** | | | | | |
| Hay Crops[8] | ha | 44,532 | 54,897 | 50,618 | 46,899 ← |
| Field Crops[8] | ha | 4,579 | 3,781 | 3,032 | 3,045 |
| Fruits, Berries & Nuts | ha | x | 14 | 15 | 13 |
| Vegetables | ha | 36 | 47 | 29 | 68 |
| Nursery Products | ha | 36 | 23 | 21 | x |
| Sod Grown for Sale | ha | x | 0 | 0 | 0 |
| Greenhouse Flower Production | $m^2$ | 4,981 | 9,016 | 11,951 | x |
| Greenhouse Vegetable Production | $m^2$ | 1,005 | x | 4,986 | x |
| Other Greenhouse Production | $m^2$ | 42,399 | x | na | x |
| Mushrooms | $m^2$ | 0 | 46 | 0 | x |
| Christmas Trees | ha | 170 | 20 | 19 | 60 |
| | | | | | |
| **Area Irrigated** | **ha** | **18,155** | **19,420** | **19,566** | **16,820** |
| | | | | | |
| **Total Farm Capital** | | **$761,119,438** | **$935,065,059** | **$1,112,424,814** | **$1,408,589,895** |
| **Total Gross Farm Receipts** | | **$55,436,923** | **$60,788,027** | **$66,305,364** | **$55,306,909** |
| **Total Wages and Salaries Paid** | | **$8,567,590** | **$8,322,323** | **$9,244,919** | **$6,236,551** |

$\bar{x}$ - Capital - $1,254,308

$\bar{x}$ - Sales - $49,248

# Cariboo Regional District

| Animals on Farms | 1996 | | 2001 | | 2006 | | 2011 | |
|---|---|---|---|---|---|---|---|---|
| | Farms | Number | Farms | Number | Farms | Number | Farms | Number |
| Hens & Chickens | 245 | 35,365 | 298 | 15,995 | 283 | x | 266 | 16,320 |
| Turkeys | 47 | 664 | 66 | 1,544 | 54 | 1,330 | 45 | 1,106 |
| Total Other Poultry | 104 | 877 | 100 | 1,378 | 66 | 762 | 48 | 941 |
| Cattle & Calves | 777 | 127,672 | 758 | 135,435 | 729 | 127,914 | 615 | 92,569 |
| *Dairy Cows* | *85* | *1,129* | *29* | *221* | *19* | *184* | *17* | *1,090* |
| *Beef Cows* | *636* | *55,336* | *633* | *57,498* | *637* | *57,015* | *510* | *39,430* |
| Pigs | 131 | 917 | 65 | 333 | 88 | 819 | 79 | 782 |
| Sheep & Lambs | 115 | 6,394 | 126 | 5,908 | 124 | 6,767 | 98 | 4,177 |
| Horses & Ponies | 725 | 5,583 | 733 | 6,418 | 726 | 6,236 | 665 | 4,986 |
| Goats | 59 | 598 | 57 | 585 | 59 | 577 | 49 | 925 |
| Wild Boar | na | na | 3 | x | 2 | x | 2 | x |
| Mink | 0 | 0 | 0 | 0 | 2 | 0 | 2 | x |
| Fox | 0 | 0 | 1 | x | na | na | na | na |
| Bison | 6 | 560 | 5 | 548 | 9 | 405 | 6 | 100 |
| Deer | 5 | 281 | 0 | 0 | 0 | 0 | 1 | x |
| Llamas & Alpacas | 12 | 75 | 31 | 271 | 60 | 652 | 53 | 568 |
| Rabbits | 70 | 985 | 16 | 678 | 42 | 576 | 32 | 352 |
| Colonies of Bees for Honey | 29 | 529 | 29 | 778 | 24 | 590 | 18 | 257 |

**Credits**

*Source: Statistics Canada. Census of Agriculture, 1996, 2001, 2006, 2011, unless otherwise specified.*
*Prepared by Ministry of Agriculture, Statistics and Research. January 2013*

**End Notes**

*1 Source: Statistics Canada. Census of Population.*
*2 Source: Statistics Canada, Geosuite, Land Area file: http://www12.statcan.gc.ca/census-recensement/2006/ref/dict/tables/table-tableau-7-eng.cfm*
*3 Source: Agricultural Land Commission. Agricultural Land Reserve as of January 1, 2008 (for 2006) and April 1, 2012 (for 2011).*
*4 Source: Ministry of Agriculture, Adapted from Statistics Canada Censuses.*
*5 Total farmland area includes both workable and non-workable land on farm operations in B.C.*
*6 Crops includes: hay crops, field crops, total vegetables, total fruits and nuts, sod and nursery products.*
*7 Other farmland area includes: woodland, wetlands, Christmas tree land, land on which farm buildings, barnyards, lanes, home gardens, greenhouses and mushroom houses are located, and idle land.*
*8 Does not include those crop areas suppressed to meet the confidentiality requirements of the Statistics Act.*

**Notes**

*x - indicates farms reporting but information suppressed to meet the confidentiality requirements of the Statistics Act*
*na - indicates data is not available for a specific reference period*

BRITISH COLUMBIA | Ministry of Agriculture

Agronomy 212 - Grain and Forage Crops

# Growing degree-day calculation

The growth rate of many biological organsims is controlled primarily by temperature. Figure 1 demonstrates a generalized response of growth rate to increasing temperature. Growth begins at some minimum (in this case 50°F). The rate of development increases with rising temperature until it reaches a plateau at some optimum temperature (86°F in the figure). As temperature increases above the optimum the growth rate declines. The shape of this response curve is similar among many organisms; however, the minimum, optimum, and maximum temperature will vary.

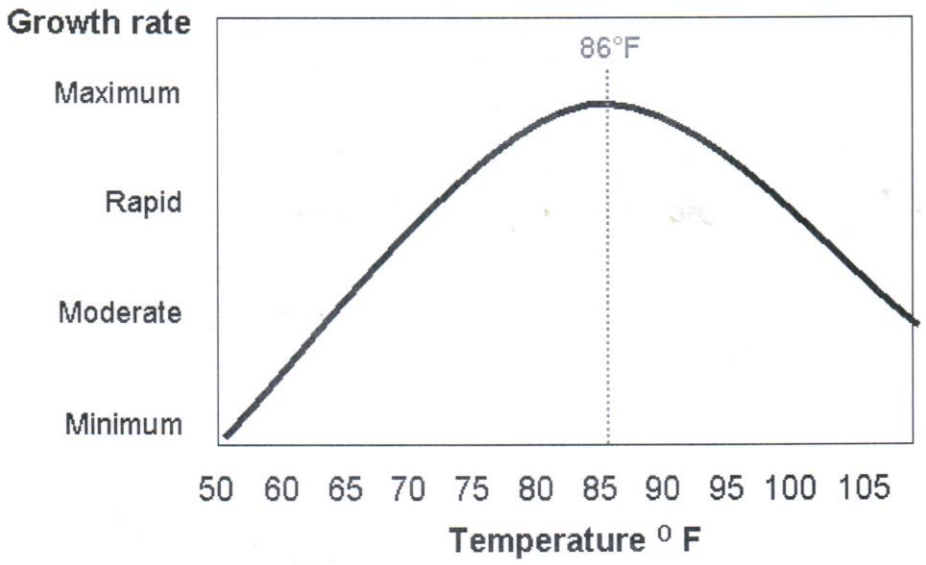



**Figure 1. Growth rate response of a hypothetical organism to increasing temperature.**

When an organism's growth rate is predominantly under temperature control its rate of development can be characterized using a system called growing-degree days (GDD) or heat units (HU). This GDD concept assumes that:

1. There is a base temperature below which the organism does not grow or grows very slowly.
2. The growth rate increases with temperature above the base temperature.
3. Growth and development are closely related to daily temperature mean accumulations above the base temperature.

GDD are calculated by determining the mean daily temperature and subtracting it from the base temperature needed for growth of the organism. Limits are usually set on the low and high daily temperature so only temperatures that result in additional growth rate are considered. The

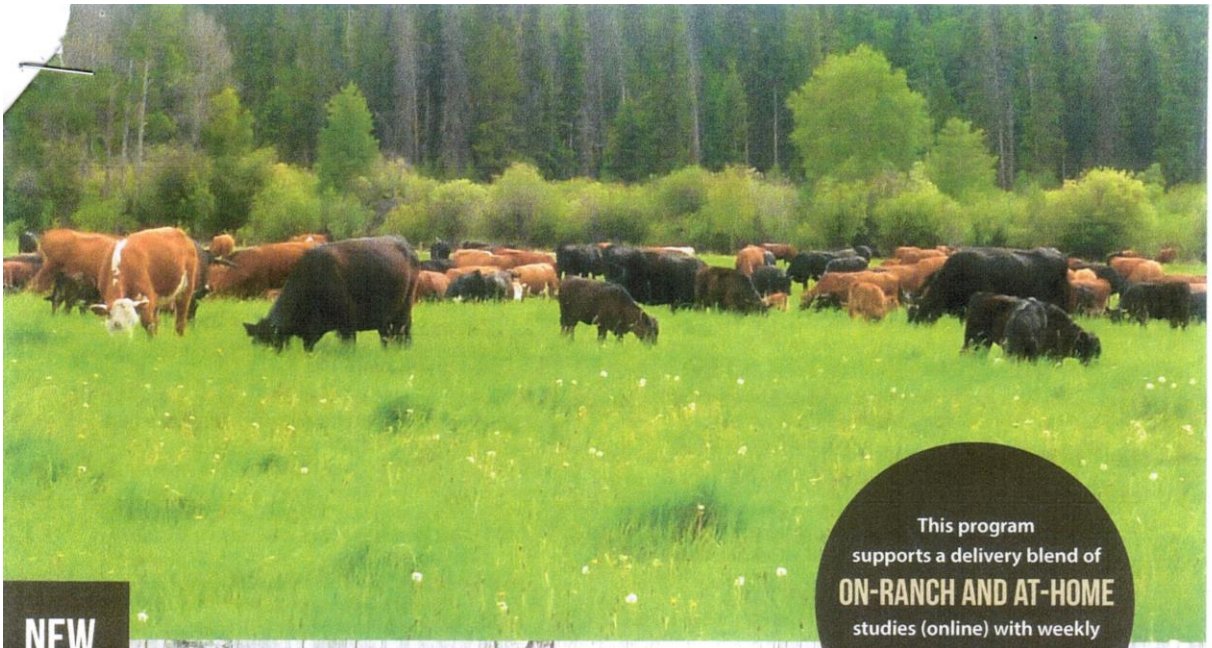
# Appendix B
# Future Projections: Climate Maps & PCIC Tables

**TABLE 2** Cariboo Regional District Climate Projections — 2020s

| Climate Variable | Time of Year | Projected Change from 1961-1990 Baseline to 2020s | | |
|---|---|---|---|---|
| | | Cariboo (Range) | Cariboo (Average) | BC (Average) |
| Mean Temperature (°C) | Annual | +0.4 °C to +1.5 °C | +1.0 °C | +1.0 °C |
| Precipitation (%) | Annual | -2% to +7% | +4% | +4% |
| | Summer | -9% to +8% | -3% | 0% |
| | Winter | 0% to +8% | +4% | +4% |
| Snowfall (%) | Winter | -13% to +3% | -2% | -2% |
| | Spring | -60% to +1% | -30% | -30% |
| Growing Degree Days (degree days) | Annual | +69 to +230 | +147 | +153 |
| Heating Degree Days (degree days) | Annual | -540 to -161 | -344 | -354 |
| Frost-Free Days (days) | Annual | +6 to +22 | +12 | +10 |

**TABLE 3** Cariboo Regional District Climate Projections — 2050s

| Climate Variable | Time of Year | Projected Change from 1961-1990 Baseline to 2050s | | |
|---|---|---|---|---|
| | | Cariboo (Range) | Cariboo (Average) | BC (Average) |
| Mean Temperature (°C) | Annual | +1.1 °C to +2.6 °C | +1.8 °C | +1.8 °C |
| Precipitation (%) | Annual | 0% to +13% | +6% | +6% |
| | Summer | -15% to +4% | -7% | -1% |
| | Winter | -3% to +14% | +7% | +8% |
| Snowfall (%) | Winter | -15% to -3% | +9% | -10% |
| | Spring | -74% to -12% | -55% | -58% |
| Growing Degree Days (degree days) | Annual | +160 to +435 | +280 | +283 |
| Heating Degree Days (degree days) | Annual | -927 to -400 | -630 | -648 |
| Frost-Free Days (days) | Annual | +14 to +34 | +23 | +20 |



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