



THE HOLM TEAM *Agriculture Economics Journalism Trade Int'l Cooperation*

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Submission to CEAA/EAO Joint Review Panel
BC Hydro Site C Clean Energy Project
Environmental Impact Statement (EIS) –
Potential Project Impact on Agriculture (Economic)

Wendy Holm, P.Ag.

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“...it is a region of exceedingly good productivity. ... There is a broad-based diversified agricultural industry. ... climate is extremely favourable. ... favourable distribution of moisture, combined with lower evaporation than in the south, makes efficient moisture use possible. ... the reduction in the growing season is compensated for by increase in day-length. The portion of the crop that is produced for seed is particularly significant. ... virtually all of Canada’s seed of creeping red fescue... 40% of Canada’s alfalfa seed, 20% of sweet clover, 50% of red clover and 70% of Alsike clover. All grow well. Complementary to legume seed production is a rapidly expanding honey industry that will be based on output from approximately 50,000 colonies of bees. ... Finally now in the region a nucleus of small but diversified horticultural enterprises producing potatoes, carrots, turnips, cucumber, tomatoes, cabbage, sweet corn and other staples. ... What must concern us is... the economic forces that may exist in the future to cause this land to be developed improperly. The future of agriculture in the Peace is equally important to other segments of government and to industry that must give it direction and support during its development. During the past 10 years, agricultural lands in the Peace River region have been brought into production at from 100 to 200 thousand acres per year... Undoubtedly the rate of development will continue to be substantial. We would expect that within a rather short period of time the point will be reached where a further 1 million acres are being brought into production every 4 years. ... Since bees are required for the pollination of legumes for seed and of canola, future development must be based on a well-coordinated honey production industry. And finally, we cannot visualize the future without at least moderate use of the preferred river valley locations for growing a wide range of horticultural crops including potatoes, carrots, turnip, cabbage, onions, corn, strawberries and raspberries. With intensification, a number of other vegetables and fruits could be grown. Other specialties may broaden the production base and benefit the whole industry.”

*Art Guitard, Director,
Beaverlodge Research Station,
Beaverlodge, Alberta. 1965*

INTRODUCTION

I am a Canadian Agrologist with expertise in agricultural economics and public policy. I have been practicing in Canada for 40 years. I am a former President of the B.C. Institute of Agrologists, a former BC Representative on the Agricultural Institute of Canada and was named BC Agrologist of the Year 2000. I am a recipient of the Rosemary Davis Award (2009, Farm Credit Canada), the Distinguished Alumni Award (Faculty of Agriculture, UBC 2008), two Queens Medals (1993, 2002) and eight national farm journalism awards.

APPROACH AND CAVEATS

My role as an Agrologist was to consider the agro-economic implications of the proposed Site C dam and their implications for public policy. My work, working in close tandem with G.G. Runka Land Sense Ltd., consisted of:

- a) reviewing and commenting on the [EIS guidelines](#) (2012),
- b) reviewing and commenting on BC Hydro’s Environmental Impact Statement ([GAP ANALYSIS, spring of 2013](#)),
- c) conducting a field visit and meeting with area farmers and clients (October 2013),
- d) background research, phone interviews with stakeholders,
- e) preparing a formal written submission to the Panel and
- f) attending in person before the Panel to provide evidence and respond to questions.

In the 20 days budgeted for this analysis, it was impossible to thoroughly review the entire EIS document, comprising ± 15,000 pages including all figures and appendices.

In addition to limitations imposed by the massive digital size and lack of access to hard copy of the EIS, our “gap analysis” – the backbone of the work - was made much more difficult by the extremely complex Table of Contents and convoluted, confusing organization of material.

While efforts were made to crosscheck volumes and sections to determine the presence or adequacy of information deemed important to agriculture, some errors and/or omissions should be expected.

OPENING STATEMENT

In my opinion, Panel members do not have enough information before them to evaluate the magnitude of public costs arising from flooding of 15,965 acres of class 1-7 land, 10,953 acres of which are high capability, class 1-5 farmland.

Blessed by the only Class 1 climate north of Prince George, the fertile alluvial soils of the Peace River Valley receive both a crop range and a productivity bonus from this unique microclimate.

Capable of producing almost as wide a variety of crops as BC’s fertile Fraser Valley, the Peace River Valley is a key part of our provincial food resource.

As transportation becomes more costly and water more scarce, the fertile farmlands of BCs Peace River Valley provide the resilience to supply local, healthy, nutritious foods to BC’s communities.

In their EIS, the Proponent both underestimates and undervalues the impact of removing this strategically important farmland from the natural capital of this province.

ANALYSIS

The Proponent, in its EIS, evaluates the impact of the dam based on four criteria:

1. loss of agricultural land
2. effects on farm operations
3. change to agricultural economy
4. change to regional food production

and concludes that the agricultural impact arising from the loss of 6,449 hectares (15,965 acres) of class 1-7 farmland is insignificant, because all “costs” associated with any such loss can be mitigated and/or compensated.

The difficulty lies in the fact that the Proponent, in its 15,000+ pages of analysis:

1. understated the land that will be lost and or impacted
2. undervalued private and public costs of this loss/impact
3. underestimated impact on agricultural economy due to an impoverished baseline
4. used too narrow a definition of self-reliance and resiliency

LAND LOST TO THE DAM

The building of Site C dam will impact 12,759 hectares (31,528 acres) of class 1-7 land in BC's Peace River Valley.

Of this, some 6,290 hectares (15,543 acres) lie within the project's flood, stability and landslide-generated wave impact lines. The impact of the project on these acres of class 1-7 land will be addressed through "mitigation".

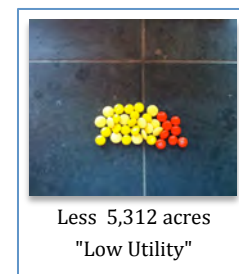
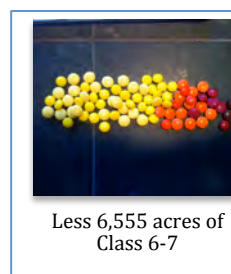
The remaining land, some 6,469 hectares (15,985 acres) will be permanently lost; 4,523 hectares (11,177 acres) from the reservoir, 330 hectares (815 acres) from the construction of roads, 243 hectares (600 acres) from the dam and its access ways and 1,373 hectares (3,393 acres) from erosion over the next 100 years.

Of the 6,469 hectares (15,985 acres), 2,653 hectares (6,555 acres) - all of the class 6 and 7 land - is removed from loss calculation. Class 6 land is considered rangeland, a critical resource to ranchers in the Valley. Since BC Hydro groups Class 6 and 7, it is impossible to know how much productive rangeland has been removed from the calculation of farmland loss.

After removing farmland that will be impacted but not flooded by the dam and then further removing all class 6 and 7 land, the 12,759 hectares (31,528 acres) of class 1-7 land have been reduced to a loss of 3,816 hectares (9,429 acres) of Class 1-5 lands.

Using a system of "utility classes" apparently developed by the Proponent for this project, 3 out of 5 of these Class 1-5 lands are further eliminated (reduced by 2,150 hectares or 5,312 acres) on the argument that they have "low utility" based on the Proponent's interpretation of *land capability and constraints on agricultural use (location, access, parcel size, land ownership and tenure, land use plans and designations)*.

This is very significant to the modeling exercise - according to BC Hydro's model, this 1,666 hectares of high capability land is all that will ever be cultivated over the next 100 years.



When I showed him the numbers, Ron Friesen, third generation vegetable grower in the Peace River's Dunvegan Valley, had this to say:

“... I was thinking about the sudden shrinkage in the agricultural land area that would be lost if Site C were to proceed. B.C. Hydro might well have decided to include only the best of the soil on those flats. If that was the case I wanted to say that on both the Shaftesbury flats and Dunvegan the soils are also variable but that has never prevented the market gardeners from utilizing their fields and productivity in a manner similar to those with the high quality soils. In this situation it is the climate that is the equalizing factor in terms of crop capabilities...”

A Comparison of Farm Land Impact of Site C Dam, in Hectares and Acres

IMPACT IN HECTARES								
	class 1	2	3	4	5	1 TO 5	6 and 7	TOTAL
	IMPROVED RATINGS	IMPROVED RATINGS	IMPROVED RATINGS	IMPROVED RATINGS	IMPROVED RATINGS	IMPROVED RATINGS	IMPROVED RATINGS	IMPROVED RATINGS
LAND LOST TO DAM								
EROSION OVER LIFE OF DAM (100 YR)	10	56	46	34	15	161	1,212	1,373
IMMEDIATE LOSS	1,547	1,415	466	139	88	3,655	1,441	5,096
LAND LOST TO DAM	1,557	1,471	512	173	103	3,816	2,653	6,469
COMPROMISED								
flood	-	111	40	-	13	164	39	203
stability	-	84	39	12	5	140	5,773	5,913
landslide generated wave	-	148	12	2	5	167	7	174
LAND COMPROMISED BY DAM	-	343	91	14	23	471	5,819	6,290
TOTAL IMPACT	1,557	1,814	603	187	126	4,287	8,472	12,759
IMPACTED	12,759							
COMPROMISED	(6,290)							
LOST	6,469							
reservoir		4,523			(1,326)		LESS ASSUMED TO ERODE OVER 100 YEARS	
hwy		330			541		cultivated	
erosion		1,373			1,183		range	
dam		165			3,419		idle	
access		78			5,143		Land still here 100 years fm now	
LANDS LOST TO DAM		6,469		MODEL	1,666		CULTIVATED LAND LOST NEXT 100 YEARS	
LESS CLASS 6&7		(2,653)		MODEL	3,477		RANGE LAND LOST NEXT 100 YEARS	
CLASS 1-5 HIGH CAPABILITY Lands Lost		3,816						
LESS CLASS 1-5 LAND CONSIDERED low utility		(2,150)						
Cultivated land lost - NEXT 100 YEARS		1,666	MODEL					

IMPACT IN ACRES								
	class 1	2	3	4	5	1 TO 5	6 and 7	TOTAL
	IMPROVED RATINGS	IMPROVED RATINGS	IMPROVED RATINGS	IMPROVED RATINGS	IMPROVED RATINGS	IMPROVED RATINGS	IMPROVED RATINGS	IMPROVED RATINGS
LAND LOST TO DAM								
EROSION OVER LIFE OF DAM (100 YR)	25	138	114	84	37	398	2,995	3,393
IMMEDIATE LOSS	3,823	3,497	1,152	343	217	9,032	3,561	12,592
LAND LOST TO DAM	3,847	3,635	1,265	427	255	9,430	6,556	15,985
COMPROMISED								
flood	-	274	99	-	32	405	96	502
stability	-	208	96	30	12	346	14,265	14,611
landslide generated wave	-	366	30	5	12	413	17	430
LAND COMPROMISED BY DAM	-	848	225	35	57	1,164	14,379	15,543
TOTAL IMPACT	3,847	4,482	1,490	462	311	10,593	20,935	31,528
IMPACTED	31,528							
COMPROMISED	(15,543)							
LOST	15,985							
reservoir		11,177			(3,277)		LESS ASSUMED TO ERODE OVER 100 YEARS	
hwy		815			1,337		cultivated	
erosion		3,393			2,923		range	
dam		408			8,449		idle	
access		193			12,709		Land still here 100 years fm now	
LANDS LOST TO DAM		15,985		MODEL	4,117		CULTIVATED LAND LOST NEXT 100 YEARS	
LESS CLASS 6&7		(6,556)		MODEL	8,592		RANGE LAND LOST NEXT 100 YEARS	
CLASS 1-5 HIGH CAPABILITY Lands Lost		9,430						
LESS CLASS 1-5 LAND CONSIDERED low utility		(5,313)						
Cultivated land lost - NEXT 100 YEARS		4,117	MODEL					

Use of Utility Ratings

The Proponent's "utility ratings" fly in the face of BC's Agricultural Land Commission, which explicitly – as it should - delinks any discussion of economics from the evaluation of BC farmland. A very important part of BC's natural capital, refusing to allow economics to be a criteria for exclusion helps protect this natural capital from being withdrawn for private good. BC courts have upheld this position:

"...In this case, the respondent [Agricultural Land Commission] submits that it would undermine the purpose of the Act if the Commission were compelled to exclude land once an applicant had demonstrated that he was unable to farm the land commercially. I agree with that submission. As the chambers judge observed, accepting Brentwood's position would inevitably lead to the erosion of the ALR based on prevailing economic conditions and that would be directly contrary to the Commission's mandate to preserve agricultural land..."
Justice Rowles of the Court of Appeal of B.C.¹

In other words, the courts have said that the focus for decision-making by the Commission is not on the economic viability of the land - nor the needs of the community (however defined) - but on the protection of agricultural land. A *"test which focuses on the present and potential future needs for agricultural land through capability more than economic viability is more in tune with the Act as a whole"*.²

Exclusion of Alberta³

Alberta farmers are excluded from the agriculture impact assessment. According to those I spoke with, they expect to be negatively affected by the dam.

When the first dam was built on the river, the 2-month period of erosion from the spring freshet was extended to 5 months, now beginning in mid December, as water was run through the turbines to generate power for peak season demand. The water released after this process is also reportedly warmer. The higher volume of warmer water for an extended period in the winter results in a persistent "slush" that builds up to create ice dams, back flooding fields. This can delay spring work and access to early irrigation (e.g. strawberries).

Another impact of these "power freshets" is that the river doesn't freeze until late winter, when power needs drop off, and then only for a few weeks. Normally the river would freeze in mid December and become part of the transportation corridor. Lack of a freeze up impacts negatively the transport of grain across the river. The Site C dam is considered by area farmers to exacerbate these impacts. The losses to farmers downstream of the Alberta border have not been measured.

¹ Brentwood Pioneer Holdings Ltd. v. British Columbia (Agricultural Land Commission), [2000] B.C.J. No. 972; 2000 BCCA 320; (2000) 186 D.L.R. (4th) 385; (2000) 138 B.C.A.C. 80; (2000) 77 B.C.L.R. (3d) 79 (B.C.C.A)

² British Columbia's Agricultural Land Reserve: A Legal Review of the Question of "Community Need" Smart Growth BC. April 2007

³ Based on personal conversations with farmers and Agrologists in Alberta's Peace River Valley during early December 2013.

ESTIMATING LOSS TO FARMERS

Mitigation

There is inadequate consideration given to economic impact on farmers, including those arising from slumping, loss of unique micro-climate farmland, loss of future Crown grazing lands and constraints placed on management of land within and adjacent to stability impact lines. Further, a five-year monitoring period is woefully inadequate.

Compensation

Compensation to farmers for land loss will be a private negotiation between the farmer and the Proponent that will most likely also be bound by confidentiality. Based on land values - essentially expropriation - it will not reflect the investment generations of farmers have placed in the land, nor the natural capital belonging to our children and future generations for whom this land guarantees food security and resilience.

MODELING THE 100 YEAR LOSS TO THE PUBLIC

Overview

The model uses an impoverished baseline, assumes today is predictive tomorrow, adopts a wooden decision-making model that undervalues the agro-economic loss, uses a higher-than-appropriate social discount rate (the effect of this is that benefits in the future have a lower value today) and does not include in the modeling benefits of local food security that relate to human nutrition, health and well being. Nor of the role of the farmers and the infrastructure they engender (suppliers, processors, farm markets, 4-H clubs) in support of community.

Baseline

BC Hydro models the no-dam scenario (“benefits lost”) using a baseline of 5,143 hectares⁴ (6,469 hectares less 1,326 hectares deemed of “low utility”); 1,666 of which are class 1-5 lands. Land use today on 541 hectares predicates the model’s interpretation of land use on the 1,666 for the next 100 years.

Shadow of the Dam

The “shadow of the dam” refers to the flood reserve that fell across the farmland in 1957. Considerable farmland was purchased by BC Hydro, farmers were told not to get too attached to their fields as Site C moved on, then off, then on again to the provincial drawing boards. Naturally, this has prejudiced farm decision-making. As a result, current land use does not reflect the agro-economic potential of the land (how that land might be farmed today absent the shadow of the dam).

BC Hydro EIS Site C “No Dam” Scenarios, 100 years ahead

BASELINE	Scenario		
	2012	2112	2112
(ha)	(ha)	(ha)	(ha)
Vegetables	-	100	200
Canola	117	360	317
Grain	90	277	244
Forage	251	773	680
Pasture	83	256	225
Total cultivated	541	1,666	1,666
Range	1,183	3,477	3,477
Idle	3,419		
TOTAL	5,143	5,143	5,143

BASELINE	Scenario		
	2012	2112	2112
(%)	(%)	(%)	(%)
Vegetables	0%	0%	4%
Canola	2%	7%	6%
Grain	2%	5%	5%
Forage	5%	15%	13%
Pasture	2%	5%	4%
Range	23%	68%	68%
Idle	66%	0%	0%

⁴ Excluded from the baseline is 1,326 hectares of land deemed low utility. This could be class 7 soils, but cannot be identified as such because class 6 and 7 soils are combined on one category. Class 6 lands are valuable grazing lands.

Modeling: Today Is Predictive Of Tomorrow?

Observing “...the bulk of Peace Agricultural Region agriculture is oriented to the export of field crops and livestock. The agricultural support industry and infrastructure is set up for bringing inputs in and transporting harvested products to the U.S., Asia, and other provinces...” the Proponent models on this, failing to recognize the effect of the unique microclimate and the shadow of the dam. As a result, the model expands today’s 541 hectares of canola, grains, forage and pasture to 1,666 hectares of canola, grains, forage and pasture 100 years from now.

The scenarios vary only the number of hectares moving into vegetables each year (0, 1 or 2 ha). They neither envisage nor capture opportunities arising from an economic and policy environment that favours robust development of the agricultural potential of the Peace River soils.

Revenue

The Proponent says the model assumes an increase in agricultural revenues of 0.5% per annum, varied by plus/minus 0.25%. Below are Gross Receipts per Hectare, modeled for Scenario 2 (.05% increase in revenues per annum). The returns per hectare for canola, grains, forage and pasture in Year 100 (expressed in Year 1 dollars) are identical to those in the Year One baseline.

COMPARISON OF GROSS RETURNS PER HECTARE, CULTIVATED LAND, NO-DAM SCENARIO
BC EIS - Site C Dam

YEAR ONE				YEAR ONE HUNDRED (In Year 1 dollars)			
Hectares Cultivated	Gross Farm Receipts	Direct Expenses	Gross Receipts per Hectare	Hectares Cultivated	Gross Farm Receipts	Direct Expenses	Gross Receipts per Hectare
-	-	-	\$ -	100	493,857	171,703	\$ 4,939
117	150,151	69,473	\$ 1,283	339	434,633	201,099	\$ 1,282
90	82,134	40,048	\$ 913	261	237,749	115,924	\$ 911
251	120,972	52,991	\$ 482	727	350,169	153,390	\$ 482
83	30,752	5,841	\$ 371	240	89,015	16,908	\$ 371
1,183	7,607	4,082	\$ 6	3,477	22,404	12,023	\$ 6
5,144	391,616	172,435	\$ 76	5,144	1,627,827	671,047	\$ 316

As prices of imported products increase with higher transportation costs, higher energy costs, reduced water for irrigation, shortages of farmland and increased demand for food from a growing population, food prices can be expected to rise considerably. This scenario was not modeled.

Social Discount Rate

The Proponent assumes social discount rate of 3.5% for first 50 years and 2.5% for second 50 years. A social discount rate of 3.5% is extremely high. The higher the discount rate, the greater discount is applied to the value of benefits which lie in the future. Stern⁵⁶, in his respected Review on the Economics of Carbon Credits suggests a discount rate of 1.4% is far more appropriate. This would have the result of substantively raising the public cost of the project.

⁵ Valuing the Future: the social discount rate in cost-benefit analysis. Australian Gov't Productivity Commission, 2010

⁶ Theory and Practice in the Choice of Social Discount Rate for Cost -benefit Analysis: A Survey Juzhong Zhuang, Zhihong Liang, Tun Lin, and Franklin De Guzman Asian Development Bank

Risk

There is inadequate analysis of the economic impact of risks such as climate change, higher fuel oil prices, increased concentration in agri-food markets and their impact on food costs.

Loss Estimate

The Proponent estimates 100-year loss ranging from a low of \$13.0 million to a high of \$31.5 million. Because of the errors noted in this paper, these figures cannot be considered to represent the loss arising from the construction of the Site C dam.

AGRICULTURAL ECONOMIC ACTIVITY, FOOD PRODUCTION AND CONSUMPTION

To estimate the economic activity lost if these lands are removed from agriculture, the Proponent uses a multiplier of 1.8 times total farm direct expenses. Based on Scenario Two of the model, they estimate foregone economic activity to range from \$310,000 in Year One to \$1.21 million in Year 100 (Year 1 dollars). The above-noted errors in the model render this figure meaningless.

Estimates of jobs foregone as a result of the building of the dam were based on a ratio of 0.91 indirect jobs for every one on farm job. Because they do not consider family labour (80% of the farm jobs fall in this category), their estimate of 1-2 person years of employment was anemic and meaningless.

The Proponent projects population growth in the Peace Agricultural District to average 1.09% per year over the next 100 years, resulting in a tripling of population by 2012. In 2012, Fort St John and Dawson Creek both ranked⁷ within BC's top ten growth municipalities at 2.8% and 1.7% annual growth, respectively. To the extent that the Proponent's assumption of population growth is low, their statements concerning food self-reliance are over stated.

The Proponent concludes there will be no adverse effects on food self-reliance for the Peace Agricultural Region because any climatically adapted crops that are needed can be grown outside the Project Activity Zone.

FAILURE TO CONSIDER SOCIAL IMPACT

The Proponent does not measure the economic effect of reduced food sufficiency and high access costs on nutrition, poverty, health and social costs for local and northern communities. Nor of the role of the farmers and the infrastructure they engender (suppliers, processors, farm markets, 4-H clubs) in supporting communities. Nor does it acknowledge the psychological and social costs arising from the disruption to families and communities if the project goes ahead.

FAILURE TO CONSIDER CUMULATIVE IMPACT

There is no assessment of the combined direct and indirect impacts of reservoir flooding, access and transportation changes, ground and surface water quality/quantity changes, land use changes and forced management modifications which impact farmers in the short, medium and long term. Nor is there any assessment of the combined direct and indirect effect of flooding these lands on future food insecurity, food import-dependence, poor nutrition and food poverty.

⁷ 2012 Sub Provincial Population Estimates, BC Stats, Province of BC Jan 14, 2013

THE UNIQUENESS OF PEACE RIVER VALLEY SOILS

All of the above point to one major problem in the Proponents analysis: failure to recognize the agricultural potential of the alluvial soils that will be lost if the dam proceeds. Because of its unique, class one micro-climate, the fertile alluvial soils of BC's Peace River Valley receive both a productivity and a range of crops bonus. This means that they can easily produce many of the vegetable crops grown in the Fraser Valley and imported from California and Mexico, including:

- early and late maturing corn,
- berries (raspberries are indigenous)
- heat loving crops (beans, cucumber, eggplant, peppers, tomatoes, squash, melons, okra)
- cool hardy crops (celery, onions, broccoli, cauliflower, cress, lettuce)
- cold tolerant crops (garlic, leeks, mustard greens, kale, radish, spinach, chard, parsley, herbs, cabbage kohlrabi, brussel sprouts, kale,) and
- root crops (including parsnips, carrots, potatoes, rutabagas, turnips, beets)

The valley also supports the production of grains to support a healthy livestock sector, including:

- Cereal grains
- Wheat
- Winter wheat
- Barley
- Fall rye
- Flax
- Rapeseed

Because the EIS does not properly identify the climatic importance of these soils, it cannot properly assess the impact that the Project will have on their loss.

FOOD SELF RELIANCE AND FOOD SECURITY

The global trend towards food self-reliance and local food production is well documented. It arises from concerns with food security and the vulnerability created by community reliance on imported food. (What is the difference between food self-reliance and food security? According to the Vancouver Policy Council: "...*food security is a robust concept that includes several parameters in addition to the physical production of food. Self-reliance is the ability to meet consumption with what is supplied by domestic production...*")

Food security has become a concern as a result of increasing energy and transportation costs related to fossil fuel depletion; dwindling water supplies in many food production regions (e.g., California); conversion of foodlands to energy crops and development; the impact of climate change on global food production; the impact of population growth on the demand for food and the increase in incidences of contamination in our food supply.

As defined by The Centre for Trade and Policy Law at Carleton University,⁸ Local Food Security is *the right of people to local food production, healthy and ecological, realized in equitable conditions that respect the right of every partner to decent working conditions and incomes.*

In its Food Secure Vancouver Baseline Report,⁹ Vancouver Food Policy Council considers that food

⁸ Local Food Systems And Public Policy: A Review Of The Literature Équiterre & The Centre for Trade Policy and Law, Carleton University September 2009

⁹ In Food Secure Vancouver Baseline Report⁹ (Vancouver Food Policy Council, March 2009)

security is achieved when the structure and capacity of the food system is resilient and adaptive and can meet the food related human, cultural, economic, social and environmental needs of the individual and community.

The Economic and Social Robustness of Local Food¹⁰

Local Food Systems are more socially and economically fit, according to Carleton University's Centre for Trade Policy and Law:

<ul style="list-style-type: none"> • LFS's capture more of the value added that would normally be captured by the more economically powerful distributors, processors, and retailers.
<ul style="list-style-type: none"> • LFS's add an additional 7-10% of net value added as a result of organic farming, quality production, and direct selling practices.
<ul style="list-style-type: none"> • Money spent in a localized food system is more likely to be spent within the locality rather than being siphoned off; a study by the New Economics Foundation (2001) found that every GBP 10 spent on a local food business brings GBP 25 to the local economy compared with GBP 14 if spent at a supermarket.
<ul style="list-style-type: none"> • Customers at farmers' markets are likely to spend their money on other local businesses; (studies) estimate that approximately 50% of the turnover is estimated to go back into the local economy, with some schemes reporting 80% or above.
<ul style="list-style-type: none"> • In Canada, the \$1.09 billion spent at farmers' markets is estimated to generate a total of \$3.09 billion for the local economy
<ul style="list-style-type: none"> • Employment is yet another benefit. ... In West Virginia, the state's 127 farmers' markets generate 795 jobs and 24 000 people are involved in the preparation/distribution of the food.
<ul style="list-style-type: none"> • Consumers also benefit economically from localized food systems. ...prices in the US can be up to two thirds lower at farmers' markets in the compared to supermarkets... CSA initiatives in Canada (have been shown to) save consumers 39% compared to purchasing the same organic produce from a local supermarket.
<ul style="list-style-type: none"> • LFS have positive effects on health and education: farm-to-school programs supported obesity prevention among school-aged children by providing greater access to healthy meals and an increased appeal for healthy foods. ...hands-on learning activities about agriculture helped to promote a school environment that supported physical activity and healthy eating.
<ul style="list-style-type: none"> • (Studies show that) nutrition is a benefit of LFS. Industrial agriculture makes use of a number of agro-chemicals that have negative impacts on human, animal, and plant life... Although the worst of these products have gradually been banned in the global North, they remain in use in much of the South. putting producers' health at risk, if not the consumers' as well. ... Supermarkets demand attractive looking products... produced for their superficial qualities rather than nutrition (for example, a fresh tomato today contains 61% less calcium than in the 1950s)... Long transportation and storage times, both unavoidable characteristics of the conventional distribution system ...reduce the nutritional value of foods. Though this caveat only applies to fresh produce, it is precisely through these items, and not through wheat and rice, that humans obtain their recommended daily intake of key vitamins and anti-oxidants.
<ul style="list-style-type: none"> • LFS can also contribute to battling social inequality. ... organizing farmers' markets in marginalized neighbourhoods reduces food insecurity in 'food deserts.' ... subsidized vegetable box schemes in the UK have targeted food insecure groups in particular. The US Department of Agriculture has a program where food insecure households receive 'local food stamps' redeemable only at farmers' markets, thereby combating both urban and rural poverty at the same time...

¹⁰ Local Food Systems And Public Policy: A Review Of The Literature Équiterre & The Centre for Trade Policy and Law, Carleton University September 2009

THE POTENTIAL FOR VEGETABLE PRODUCTION

Local fresh vegetables are an obvious fit for the fertile soils and class one climate of the east-west running Peace River Valley. As The BC Food Self Reliance Report¹¹ notes:

“...The largest self-reliant shortfall in B.C. is in fruit and vegetable production. To be economically viable, it needs irrigation... ..as population grows and the demand for food grows, major pressure on agricultural land will likely come in the form of:

- *the need for more irrigated land in the fruit, vegetable and dairy producing areas, and*
- *the need for more broadly applied pasture/forage management practices.*

As reported in Local Food Systems And Public Policy,¹² *“...The Greater Edmonton Alliance (2009) conducted a survey to assess the local population’s commitment to supporting a Local Food System. They secured a pledge from 712 Greater Edmonton households, comprising about 2000 individuals, to shift 40% of their current food dollars to local food when the ‘important’ and ‘very important’ challenges to buying local—as identified in their survey—food are resolved. This would result in a shift of \$2.3 million dollars annually to purchasing local foods. If 25% of Edmonton Census Metropolitan Area residents responded similarly, this would mean over \$330 million would be shifted to local foods. This would result in a total local food purchasing of \$530 million. The multiplier effect would bring the economic impact to over \$2 billion.”*

A Vegetable Industry Study, conducted in 1980¹³ concluded¹⁴ that there was significant potential for a fresh vegetable industry in the Peace River Valley.

“...The production of vegetables for the fresh market appears to hold more promise. In the Agriculture Impact study returns at the farm gate are estimated at \$400/acre, substantially more than returns to existing crops. Formal institutional barriers to marketing the crop are minimal, as distributors appear willing to purchase local produce...

...A limited amount of production for the fresh market currently exists in the valley. An expansion of this activity would appear to hold promise.

“...expansion of fresh vegetable production in the valley should be encouraged. The Alberta government has a fresh vegetable market program which has helped producers in that province expand production. The British Columbia Ministry of Agriculture might consider the application of such a program to the Peace River Valley.*

The Vegetable Study identified 1,788 hectares of alluvial soils within the Site C project area that would support fresh vegetable production. Cropped to vegetables for the fresh market, this would according to the vegetable study be sufficient to meet the nutritional requirements of a population of 1,082,896 people.

FAILURE TO CONSIDER IMPACT ON PROVINCIAL ALR

¹¹ Ibid.

¹² Local Food Systems And Public Policy: A Review Of The Literature Équiterre & The Centre for Trade Policy and Law, Carleton University September 2009

¹³ Peace River Site C Hydroelectric Development Vegetable Industry Study. Conducted for BC Hydro and Power Authority by Canadian Resourcecon Limited, R&H Services Limited

¹⁴ The bulk of the study focused on the economics of developing a vegetable industry and the cost of building a processing plant for canned and frozen vegetables. Based on scale and transportation considerations as well as dominance by retailers of the processing vegetable market, the plant was considered unviable.

The agriculture lands within the PRV boast in the only Class 1 climate for agriculture lands north of Prince George. These lands are of strategic importance to the province,

No evaluation was undertaken of how the loss of these unique and fertile Site C lands impacts the resiliency of our provincial ALR and its ability to underwrite food security. Today, over half a hectare of farmland is needed to produce food for one person for one year. BC currently produces 48% of the food it consumes. To maintain this level to the year 2025 requires that farmers increase production by 30% over 2001 levels. To produce a healthy diet for British Columbians in 2025, the BC Self Reliance Report notes farmers will need to have 2.78 million hectares in production, 218,000 of which must be irrigated.¹⁵ As of 2011, we are 200,000 acres short of this 2025 target.

RESILIENCY

Resiliency is the ability of a community to absorb shocks and remain sustainable. The Climate Change Action Plan identifies *Strengthening sector resilience* as the first Adaptation goal, defining resilience as the amount of change a system can undergo, or the amount of disturbance it can absorb, and still be able to retain the same function, services, structure and feedbacks. Sustainably.

NATURAL CAPITAL

Created by nature, not human enterprise, BC's productive farmland is natural capital. In limited supply in this mountainous province, it is our responsibility to add to this capital, not deplete it. This is accomplished through stewardship practices that enhance soil fertility, protect water resources and ensure the resilience of the farming community, whose job it is to feed our cities. Absent this, food security is impossible.

As populations increase and fossil fuels deplete, food shortages will become a problem not only for "poor" nations but for "rich nations" as well. As today's affordable food becomes tomorrow's economically rationed resource, communities with no farmland will be the clear losers as the new game of "find the food" spins out of control in a wildly cycling global economy. Those who can pay the most will. Those who cannot will go hungry.

Presently, there are over 120 global funds dedicated solely to the buy up of farmland. Canada is the number one target because our farmland is considered cheap, our infrastructure solid and our economy stable. This all happens under the radar: a stranger walks down the lane with a sack of money and a promise that no one has to know. Twenty-five years of policy abuse by Ottawa and the provinces has burdened Canada's farmers with high debt, low income and little hope for the future. No wonder the offers are being accepted. Such transactions go unmonitored.

This silent erosion of natural capital begs the question: how will future generations feed themselves? We must protect and enhance the natural capital represented by these fertile foodlands.

¹⁵ BC Food Self Reliance Report, BC Ministry of Agriculture and Lands, 2006.

THE TALE OF OLD WIVES LAKE

This isn't the first time bureaucrats, government types and investors have failed to recognize the unique microclimate of the Peace River Valley. Back in the early 1880's, Dominion Land Surveyor William Ogilvie sent off the following dispatch to Ottawa:

I thus determined to proceed direct to the Peace River district as soon as possible and there survey that part of the country that was best suited for settlement, and which will inevitably in the course of a year or two be settled as all, or nearly all of the farmers around Edmonton have been in that district and would not remain where they are, were there any facilities for utilizing farm produce in the Peace River district, the opinion of all being that it is far superior to any other part of the country.

Two of the early farms were Waterhole (Milton, Lloyd, Hayes) north of Dunvegan and Old Wives Lake (Brick) at the Dunvegan-Peace River crossing. When Fred Brick grew a bumper crop of potatoes on the flats that took top prize in a world exposition in Chicago, the Old Wife began turning heads as far away as France, prompting a new wave of migration.

Despite Ogilvie's optimism, the years that followed were not fruitful for farmers who established on the bench lands. Ogilvie came back, established test stations on the benches, and after several seasons came to a very different conclusion, declaring that he:

...would not advise any one seeking a home in our Great North West to think of Peace River. There is only a limited area in the valley which is the only place where success can reasonably be expected... I regret to have to present such an unfavourable account of a region of which so much has been said and written. The soil is excellent and much of it available for immediate use cannot be denied, but the occurrence of severe frosts on the plateau where the grain is not far enough advances to resist its effects may be as far as our experience goes considered a certainty in the majority of the seasons. It may be that when the necessities of settlement require it, early seeding and other varieties of grain may materially alter conditions, but at present I would advise no one to think of farming there except in the river bottom, in which there are flats extensive enough to locate a few score homes. 1892

Like the Proponent, Ogilvie and his colleagues did not understand the unique microclimate of the region, and so did not differentiate between the uplands and the flats.

A farmer could have easily explained it to them.

R E S U M E

W E N D Y H O L M P . A g .



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CREDENTIALS:

- ✓ Professional Agrologist
- ✓ M.Sc. Agricultural Economics
- ✓ Columnist, Journalist, Writer
- ✓ Capstone Yr Master Mgmt Co-ops
Sobey Sch Bus, St Mary's Univ,
- ✓ 6 years as an Economist with
Federal Government Ottawa
- ✓ 30+yrs as a practicing Agrologist
- ✓ 15 yrs of Int'l Project Mgm't

EXPERTISE:

- ✓ Agriculture
- ✓ Governance
- ✓ Cooperation
- ✓ Economics
- ✓ Industrial Organization
- ✓ International Development
- ✓ International Trade
- ✓ Regulation
- ✓ Resources (Ag, Water)

SKILLS:

- ✓ Analysis (economic, competition,
market, strategic, trade)
- ✓ Communications
- ✓ Facilitation/Consensus building
- ✓ Project Management
- ✓ Policy Analysis
- ✓ Public Speaking
- ✓ Strategic Thinking and Planning
- ✓ Writing

EDUCATION:

Master Management, Cooperatives & Credit Unions, Sobey School of Business, Saint Mary's University, Halifax (2014)
Master of Science (Honours Thesis), Agricultural Economics, 1974. University of British Columbia.
Bachelor of Science (Magna Cum Laude), Business Admin. (Marketing), 1970. Long Island University.

HONOURS/GOVERNANCE:

Honours/Awards: GOLD: The O.R. Evans Award, Press Editorial, for *Deconstructing Martha*,
2012 Writers and Broadcasters Awards, Canadian Farm Writers Federation
GOLD: The Frank Jacobs Award, Press Column, for *Will the real chocolate milk please stand up?*,
2010 Writers and Broadcasters Awards, Canadian Farm Writers Federation
BRONZE: The O.R. Evans Award, Press Editorial, for *Canadian Cheese should be made with
Canadian milk*. 2009 Writers and Broadcasters Awards, Canadian Farm Writers Federation
2009 ROSEMARY DAVIS AWARD, Farm Credit Canada, for "passion/commitment to agriculture
GOLD: The O.R. Evans Award, Press Editorial, for *Beware a Conservative Majority*
2008 Writers and Broadcasters Awards, Canadian Farm Writers Federation
DISTINGUISHED ALUMNI AWARD –90th Anniversary, Faculty of Agriculture, UBC
for "Outstanding service to the Faculty, UBC and the Community". May 23, 2008
15th Annual Canadian International Cooperation Award for Cuba Dairy Project. May 2007
BRONZE: The Frank Jacobs Award, Press Column, for *Dual desk code for disaster*.
2006 Writers and Broadcasters Awards, Canadian Farm Writers Federation
SILVER: The O.R. Evans Award, Press Editorial, for *NAFTA should be invoked to open border*.
2004 Writers and Broadcasters Awards, Canadian Farm Writers Federation
GOLD: The Frank Jacobs Award, Press Column, for *Losing Ground*
2003 Writers and Broadcasters Awards, Canadian Farm Writers Federation
BRONZE: The O.R. Evans Award, Press Editorial, for *Supply Management Under Fire*
2003 Writers and Broadcasters Awards, Canadian Farm Writers Federation
QUEEN'S JUBILEE MEDAL honouring Her Majesty Queen Elizabeth II's Golden Jubilee
(Gov. Gen of Canada – Oct 2002 for "outstanding & exemplary achievement or service to community or to Canada)
AGROLOGIST OF THE YEAR 2000 (BC Institute of Agrologists AGM, April 27, 2001)
QUEEN'S COMMEMORATIVE MEDAL - 125th Anniversary of Canadian Confederation
(Governor General of Canada - May 1993 for "contribution to community.")
B.C. GOV'T AWARD FOR EXCELLENCE IN COMMUNITY PROGRAMMING (1992)
Columnist: Western Dairy Farmer, Ontario Dairy Farmer, Rural Voice, The Grower, other farm publications
Past-Chair: Board of Trustees, Ethical Funds Inc. (1993-94: Growth, Balanced, Income, N.A. Equity, Money Market)
Past-President: B. C. Institute of Agrologists (1989-90, member since 1972) and Vancouver Br, BCIA (1987-88)
Past-Director: STAG Advisory Board, Farmers of North America (2010-2013), Vancity Credit Union (2008 -12, 1990-96),
Vancity Community Found (2009 - 2012, 1993-96) Abbeyfield House of Bowen Island (1999-2001),
Mensa Canada (Vice President, 1998-99) VanCity Enterprises (1990-96), Women in View (1992 - 93)
Okanagan Valley Tree Fruit Authority (1992-93), Agricultural Institute of Canada (1990-92)
Editor/Author: WATER AND FREE TRADE (James Lorimer & Co. Publishers, Toronto, 1988)
Producer: Annual series of eight live, 60 minute television broadcasts from Pacific National Exhibition fairgrounds:
'91: GROWING TOGETHER and '92: FROM THIS VALLEY THEY SAY YOU ARE LEAVING:

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Lecturer, University of British Columbia LFS302: International Field Studies in Sustainable Agriculture (Cuba) May 2005-Present. Cuba-based, 3 week, 3 credit course for university students.

Senior Project Officer, Cuba. International Centre for Sustainable Cities, Vancouver. Responsible for Project development and management of projects in Cuba, fundraising, networking, presentations. 2004-2011

Participant, Short Course in Cooperative Economics, University of Bologna, Bologna, Italy. June 29 to July 9, 2009.

Enhancing Sustainable Dairy Production Capacity in Cuba. 2004 – Present Project Leader of this award-winning international project of farmer to farmer collaboration. Partners are International Centre for Sustainable Cities, Asociación Nacional de Agricultores Pequeños and Canadian International Development Agency. The Project Team consisted of Canadian dairy farmers Lorne Hansen, British Columbia; Bruce Beattie, Alberta and Jim Millson (and family), Ontario. Enhancing Sustainable Dairy Production Capacity in Cuba brought together the expertise and animal husbandry skills of Canadian dairy farmers with the ingenuity of Cuba's intensive pasture management methods to amplify and document a sustainable, pasture-based dairy production system that could serve as a model for Latin America. The Project constructed three hectares of "Pedestals" (Cuban grass/legume rotational pastures) and 16.5 hectares of solar-power fenced rotational pastures, introduced new calf management practices and the on-farm development of feed rations. This project is a first step to of more meaningful engagement and ethical sharing of capacity in support of sustainable farming communities, food security and the environment.

Phase Three. Canada-Cuba Farmer to Farmer Project (Project Leader) October 1999 - Present. Organized and led 28 additional delegations to Cuba, bringing to over 500 the number of Canadian farmers traveling to Cuba under this project for a two week, five province tour of Cuba's cooperative farms, agri processing enterprises and research facilities. In February 2005 a Cooks' Tour was organized at the request of Cuisine Canada. (see From Cuba with Love, Canadian Living, April 2006.)

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Phase Two, Canada-Cuba Farmer to Farmer Project (Project Leader) January 1999 - September 1999. August 1999. Organized and led First Cuban Delegation to Canada. Twenty seven farmers, provincial ministers of agriculture, scientists and policy makers from ten Cuban provinces visited British Columbia for a three week tour of farms, agri processing enterprises and research facilities from the Peace River to Vancouver Island. Hosted by \$95,000 in donations fund-raised for this purpose.

Phase One, Canada-Cuba Farmer to Farmer Project (Project Leader) August 1998 - January 1999. Organized and led First Canadian Delegation to Cuba. Twenty farmers from British Columbia traveled to Cuba for a ten-day, five province (Matanzas, Cienfuegos, Sancti Spiritus, Ciego de Avila, Havana) tour of Cuba's large cooperative farms, agri processing enterprises and research facilities. Coordinated by International Relations Department, Cuban Ministry of Agriculture.

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Feasibility Study, Sumas River Drainage, Abbotsford, B.C. - Volume 2 Economic Assessment, W. R. Holm and Assoc with Ker Priestman Assoc for B.C. Ministry of Agriculture and Fisheries, 1987

Who's Minding the Store? The Granville Island Public Market - An Evaluation of C.M.H.C.'s Management Practices from the Perspective of the Small Business Community, W. R. Holm and Associates for the Granville Island Businessmen's Association, February 6, 1987

Analysis of the Risks and Cost of a Sterile Insect Release Program for the Control of Codling Moth In the Okanagan Valley of British Columbia, W. R. Holm and Assoc for Reg. Devel. Br, Agri Canada, March 1986

Evaluation of Commercial Cost of Sterile Insect Release Control Program for Codling Moth in British Columbia, W. R. Holm and Associates for the Regional Development Branch, Agriculture Canada, March 1985

COMPUTER Systems Design/Programming/Analysis Background

1964-73 Computer systems analyst, project manager, information systems devel. manager and programming manager.

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CITIZENSHIP: Canadian (1976)

WORKSHOPS/PUBLIC SPEAKING

- Speaker: 60 Years On: Options for the Columbia and the Community at end of the Treaty Period. Nakusp Apr 4, 2013
- Speaker: Where Did Your Last Meal Come From? FCC Go Ag Speaker, Univ of Fraser Valley March 28. 2013
- Speaker: A Vision for the Future of Agriculture. Keynote. Wild Rose Agricultural Producers, Banff, Alberta January 2013
- Speaker: Financial Transparency: OCFAID The Case Study of Dairyland. National Farmers' Union Annual Meeting. Saskatoon, Sask November 2012.
- Speaker: Cuba's New Cooperative Path. Canadian Association for the Study of Cooperatives/Assoc of Cooperative Education Cooperating For Change In The International Year Of Cooperatives Université De Québec À Montréal, June 24-27, 2012
- Speaker: The December 2011 Havana Workshops: Reflections of Canadian Co-operators on Cuba's Economic Transformation and Decentralization. University of Havana, February 22, 2012
- Workshop: Walking the Walk: Cuba's path to a more co-operative and sustainable economy. Havana, Cuba Dec 2011
- Speaker: Case Study of Two Innovative Canadian Cooperatives in Health Care an Education. Workshop on Cooperatives and Entrepreneurial Capacity, International Cooperative Alliance, Mikkeli, Finland. August 2011
- Speaker: Food Security and Sovereignty, Planning Institute of BC. Nanaimo, June 2011
- Speaker: Tied to the Tracks: Western Canada Grazing Conference, Vermillion Alberta December 2010
- Speaker: Tied to the Tracks: Southern Alberta Conservation Association Medicine Hat, Alberta November 2010
- Speaker: Making Connections: Canada Cuba Farmer to Farmer Project Cdn Assoc for the Study of Coops, June 2010
- Speaker: The Confluence of rivers - a magical place 2010 Alberta Elk Convention, Edmonton Mar 2010
- Speaker: Food - the next oil? Alberta Farmers' Markets Association, Calgary, Feb 2010
- Speaker: Can Farming Survive? Feeders Association of Alberta, Red Deer, Jan 2010
- Speaker: The Confluence of Rivers is a Magical Place, Agriculture and Food Council of Alberta, Edmonton, Nov 2009
- Speaker: Financing Food. June 9, 2009
- Speaker: Is Farming Sustainable? Mackenzie Applied Research Association, LaHache Alberta April 8, 2009
- Speaker: Is Farming Sustainable? FarmTech Conference, Edmonton, Alberta January 28 and 29, 2009
- Panelist: Future of the Region Sustainability Dialogues on Agriculture. (Series of Four: October 2nd; November 19th, November 26th, and December 3rd 2009. Metro Vancouver Regional District
- Panelist: Panelist: Future of the Region Sustainability Summit –Stepping Stones to Sustainability. Metro Vancouver Regional District. October 20 2009.
- Keynote Beyond Blue Boxes: Rethinking Sustainability. No. Coord Action For Recycling Enterprises, AB Sept 2008
- Speaker: Eating Local, Acting Global, Making A Difference In Castro's Cuba: Brunswick, Maine April 5, 2008
- Keynote: Is Conservation Agriculture Sustainable? Saskatchewan Soil Conservation Association, February 2008
- Speaker: Cooperation, Capacity and Community: The Canada Cuba Farmer to Farmer Project 1st Trilateral Sister Cities Conference, Canada–Cuba–United States, Kingston, Ont, June 9-11, 2006
- Speaker: Changing the World, Brock House Lecture Series, Oct 2005 West Point Grey; United Church, Apr 2006
- Speaker: Farmers' Interest in the NAFTA, Wild Rose Agricultural Society, Alberta, January 6, 2005
- Speaker: Farmers' Resolution to Exempt Water from NAFTA, BC Farm Women's Network, Kel, BC Oct 23, 2004
- Speaker: Hard Ball: Playing to Win on the Farm Trade Front, Huron County Federation of Agriculture Annual Regional Meeting, Brussels, Ontario. October 21, 2004
- Speaker: How Canada's Farmers Measure Up: Support to Agriculture OECD Nations, Huron Cty Fed of Agr Oct 2004

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WORKSHOPS/PUBLIC SPEAKING (cont'd)

- Speaker: The Canada Cuba Farmer to Farmer Project: Building Capacity, Northern Bounty Conference, Cuisine Canada, Kelowna,
- Speaker: Résolution des agriculteurs en vue de soustraire l'eau de l'ALENA, Continentalisation :l'eau de l'Amérique ou l'eau des Américains? Institute de sciences de l'environnement de l'Université du Québec a Montréal, fév 2004.
- Speaker: Multinational Cooperative Capacity Building – The Canada Cuba Farmer to Farmer Project Seminario Para Onde vai a Agro-Ecologia? Goiania, Brazil, 6e8 novembro de 2003.
- Speaker: Farmers' Resolution to Exempt Water from the NAFTA, Soil & Water Cons. Soc of America, July 2003.
- Speaker: Farmers' Resolution to Exempt Water from the NAFTA, Dairy Farmers of Canada, Ottawa, Jan 22, 2003.
- Speaker: Water, Sovereignty & NAFTA: Democracy at the Brink, Cdn Conf Unity, Sovereignty & Prosperity Tor Dec 2002.
- Speaker: Canada Cuba Farmer to Farmer Project, IFOAM World Organic Congress, Victoria, BC August 2002.
- Speaker: Aboriginal Rights to Water, Water Resources & the Seabed, Pacific Bus. & Law Inst, Vanc, May 2002.
- Speaker: The Canada-Cuba Farmer to Farmer Project. Co-ops Mean Business: Highlighting the Economic and Social Impact of Cooperatives in BC University of Victoria, June 1, 2001
- Witness: Standing Committee on Foreign Affairs and International Trade on the Subject Matter of Bill C-6An Act to Amend the International Boundary Waters Treaty Act. May 16, 2001.
- Workshop: Canada-Cuba Farmer to Farmer Project; Canadian Society for International Health, Ottawa, June 2000.
- Speaker: Canada-Cuba Farmer to Farmer Project: Sustainability, Ethics and Governance, CUSO Annual General Meeting (International), Vancouver, British Columbia, June 18, 2000.
- Speaker: Canada-Cuba Farmer to Farmer Project: Sustainability, Ethics and Governance. Faculty/Graduate Students, School of International Studies, Queens Univ, March 23, 2000.
- Speaker: Canada-Cuba Farmer to Farmer Project: Sustainability, Ethics and Governance. School of Resource and Environmental Mgmt, Simon Fraser University, BC, March 20, 2000.
- Witness House of Commons Standing Committee on Foreign Affairs and International Trade on the WTO and Prop'd Free Trade Area of Americas on Water Resources and Sustainable Agriculture, Van, April, 1999.
- Workshop: The BC-Cuba Project, Certified Organic Association of BC, Naramata, BC, Mar 5, 1999.
- Speaker: WTO: Comparison of Measures of Support for Agriculture in OECD Countries, National Farmers Union, Charlottetown, Prince Edward Island, Feb 26, 1999.
- Speaker: WTO: Comparison of Measures of Support for Agriculture in OECD Countries, New Brunswick Potato Conference and Trade Show, New Brunswick, Feb 24, 1999.
- Speaker: Keynote: World Trade Organization, National Farmers Union Annual Convention: Trade as if Farmers Mattered; Saskatoon, Saskatchewan, December 4, 1998.
- Witness: B.C. Special Committee on the Multilateral Agreement of Investment concerning The Threat to Canada's Water Under the Proposed MAI, Vancouver, B.C. October 1, 1998.
- Workshop: One Potato, Two Potatoes: The New Economics of Sustainable Agriculture. Premier's Summit on Economic Opportunity - Southern Interior, Kamloops, B.C., May 28, 1998.
- Workshop: Value Added Processing of Medicinal Crops, Vernon, April 4, 1998.
- Facilitator: Vancouver Island Agricultural Survival Forum, Community Futures, Duncan, B.C. March 1998.
- Speaker : B.C. Fruit Growers Annual General Meeting, Kelowna, January 1998.
- Workshop: Strategic Plan for the B.C. Potato Industry, Town and Country Inn, Delta, October 1997.
- Workshop: International Trade Issues Related to Water Resources, Nu Chah Nulth Tribal Council, Aug-Sept. 1997.
- Chair: Views on Family Farm and the New Environment, B.C. Agriculture in the World Economy, Mar 1997.
- Workshop: Strategic Plan for the Saanich Peninsula, Saanich Fair, February 22, 1997.
- Chair: Meeting to Determine Producer Interest in a Grower Owned Feed Mill, Langley, B.C. Feb. 12, 1997.

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WORKSHOPS/PUBLIC SPEAKING (cont'd)

- Instructor: Class on Water Policy, University College of the Fraser Valley, February 4, 1997.
- Keynote: 1996 B.C. Farm Women's Conference, 100 Mile House, October 17, 1996.
- Speaker: Columbia Treaty — International Joint Commission, Rivers Canada, Nakusp, B.C. March 21, 1996.
- Speaker: First Nation Rights to Water & Water Resources, Pacific Business and Law Institute, Apr 5-6, 1995.
- Speaker: Water & NAFTA National Aboriginal Fisheries Conference, Campbellton, N.B. May 1994.
- Speaker: Water & NAFTA B.C. Council of B.C. First Nations Summit, Vancouver, B.C. April 6, 1994.
- Speaker: Water & NAFTA B.C. Aboriginal Fisheries Commission, Kelowna, B.C. March 29, 1994.
- Facilitator: Revised Management Plan for the Alaksen National Wildlife Area, Canadian Wildlife Service, 1993.
- Facilitator: Delta Rural Land Use Workshop, Corporation of Delta. 1993.
- Speaker: Water's IN the Deal — Where to From Here? Council of Canadians, Kelowna, B.C. 1993.
- Speaker: Canada's Water - For Sale or Trade?, Ktunaxa/Kinbasket Tribal Council, Kimberley, B.C. April 3, 1993.
- Speaker: Water Diversion Gathering, North Thompson Band, Shuswap Nation, Barrier, B.C. January 24, 1993.
- Witness: B.C. Select Standing Committee on Economic Development, Science, Labour, Training & Technology on the Subject of the North American Free Trade Agreement, Victoria, B.C., 1993.
- Witness: House of Commons Sub-Committee on Internat'l Trade on the Subject of the NAFTA, Van, B.C. 1992.
- Speaker: Encuentro Trinacional Sobre Agricultura, Medio Ambiente Y Tratado de Libre Comercio, Mexico. 1991.
- Speaker: Creating our Future: Steps to a More Livable Region, GVRD, Nov ember 1991.
- Keynote: Manitoba Farm Women's Conference, Brandon, Manitoba, November 1991.
- Witness: Third Proceedings on Subject Matter of Bill C-37, Softwood Lumber Products Export Charge Act, Standing Senate Ctty on Banking, Trade & Commerce, Chair: Hon. Ian Sinclair, Van, March 1987.

GAP ANALYSIS



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Summary Notes:

Gap Analysis of BC Hydro Site C Clean Energy

Environmental Impact Statement (EIS) –

Potential Project Impact on Agriculture (Economic)

Submitted to Peace Valley Environmental Association

March 15, 2013

March 15, 201

**Summary Notes: Gap Analysis of BC Hydro Site C Clean Energy Environmental Impact Statement (EIS) -
Potential Project Impact on Agriculture (Economic)**

Objective: To provide brief summary notes to Peace Valley Environmental Association and their Legal Counsel for use in preparation of a submission to CEAA regarding gaps in the Environmental Impact Statement related to the above project.

Approach and Limitations

Given the limitations of time and budget, it was impossible to thoroughly review the entire EIS document, comprising \pm 15,000 pages including all figures and appendices. Therefore, the assigned task was carried out using the following approach:

- Overview of Vol. 1-5 with specific reference to potential project impact upon agro-economics.
- More detailed review of Vol 3, Section 20 (Agriculture) with regular cross-checks to other volumes and sections as required
- Overview of targeted Figures and Appendices as required

The Issue Gap Groupings that form the basis of Table 1 emerged from the above review. Given the request for 'Summary Notes' only, the decision was taken to provide a few key examples under each of these groupings, rather than to assemble a long list of specific 'gaps' in the EIS.

While a few selected statistics (e.g. numbers of hectares) have been cited in Table 1, no attempt was made to rationalize or refute the 'numbers' provided within the EIS related to agricultural impact. Although there are perceived contradictions that may warrant analysis at some later stage, it was felt that isolating the more general issue gap groupings would be more useful at this stage of the process.

In addition to limitations imposed by the massive digital size and lack of access to hard copy of the EIS, particularly of the background map sets, this gap analysis was made much more difficult by the extremely complex Table of Contents and convoluted, confusing organization of material. While efforts were made to crosscheck volumes and sections to determine the presence or adequacy of information deemed important to agriculture, some errors and/or omissions should be expected.

General Observations

This project is premised on the assumption that power exports to the south are more valued than food production capacity in the North.

Indeed, agriculture is listed ninth in the list of valued components in the Executive Summary.

B.C. Hydro's justification for ignoring many of the items presented in the following table of GAP deficiencies and issues is that they are "insignificant" on an economic level: any future private losses (to farmers) will be handled on a farm-by-farm basis from a yet-to-be-specified mitigation/compensation fund and any public losses (to the community/region/province: the value of future production, jobs, economic activity, better nutrition and community health, generated under a "no-dam" scenario) will be more than offset by increases in productivity arising from BC Hydro-funded projects in the region.

The GAPS in the analysis include but are not limited to the following:

BASELINE – Based on the 2011 Census of Agriculture, the EIS baseline is not reflective of the productive potential of the Peace River Valley farmland. The region has been in the Site C Project Shadow for 55 years; this has adversely impacted the way the land is farmed. The effect of this GAP is that the EIS substantively undervalues the productive potential of the Peace River Valley farmland.

CLIMATE - There is no recognition of the economic benefits associated with the unique microclimate of the Peace River Valley that supports a wide range of heat-loving crops.

FARMER IMPACT - There is inadequate consideration given to economic impact on farmers including those arising from loss of unique micro-climate farmland, loss of future Crown grazing lands and constraints placed on management of land within and adjacent to stability impact lines.

PUBLIC IMPACT - The economic model developed to evaluate future public benefits under a no-dam scenario is static and wooden and does not reflect rational farm decision-making. Further it uses a very high Social Discount Rate (3.5%; should be 1.4% or less), which further understates true public value. Sensitivity analysis is inadequate.

RISK - There is inadequate analysis of the economic impact of risks such as slumping, climate change, higher fuel oil prices, increased concentration in agri-food markets and their impact on food costs. There is no cumulative analysis of risk.

SCOPE - The scope of economic impact does not consider the sector itself (the remaining farming community). It does not consider the future importance of the Peace River Valley farming to the health and nutrition of peoples living in North West Territories and Yukon. It also does not consider the impact on the provincial ALR.

NO MEASURE OF SOCIAL IMPACT. It does not measure the economic effect of reduced food sufficiency and high access costs on nutrition, poverty, health and social costs. Nor does it acknowledge the psychological and social costs to families and communities if the project goes ahead.

Table 1: BC Hydro Site C EIS Agro-Economic Related Issues - Gap Groupings and Examples

NOTE: In addition to identifying key areas where information considered important to assess project impact on agriculture is missing, “gaps” are considered to include situations where either the interpretation of the information for impact assessment purposes or the application of the interpretation to potential impact is questionable.

Issue Gap Groupings	Selected Gap Examples (dominant EIS section reference)	Comments
<p>BASELINE</p>	<p>The Baseline used in the EIS is based on current production in the Valley. This undervalues the food production potential of the Project Activity Zone (PAZ). (Vol 3, 20.2, 202.2.2, 20.2.4.2)</p> <p>BC Hydro notes acres farmed in the Peace Agricultural Region have declined in absolute terms and in relation to the rest of the province over the past decade.</p> <p>According to the EIS, from 2001 to 2011, the EIS reports livestock and poultry inventories declined in the Peace Agricultural Region by 51%, area in beef production declined by 30%, dairy by 48%, tame hay by 35%, and honeybees by 59%. Production of ewes, goats and forage seed also declined. (Vol 3, 20.2.2.72.)</p>	<p>The baseline used to estimate the magnitude of public loss arising from the construction and operation of the proposed dam should reflect how the land was cropped before the shadow of the Site C Dam Project impacted farm decision-making and reduced production.</p> <p>Production was even more robust before the shadow of the dam fell across the valley 56 years ago. Art Guitard in his 1965 paper <u>Agriculture in the Peace – Past, Present and Future</u> describes a flourishing farm economy:</p> <p><i>“...it is a region of exceedingly good productivity. ...There is a broad-based diversified agricultural industry. ...climate is extremely favourable. ...favourable distribution of moisture, combined with lower evaporation than in the south, makes efficient moisture use possible. ... the reduction in the growing season is compensated for by increase in day-length. The portion of the crop that is produced for seed is particularly significant. ...virtually all of Canada’s seed of creeping red fescue... 40% of Canada’s alfalfa seed, 20% of sweet clover, 50% of red clover and 70% of Alsike clover. All grow well. Complementary to legume seed production is a rapidly expanding honey industry that will be based on output from approximately 50,000 colonies of bees. ...Finally now in the region a nucleus of small but diversified horticultural enterprises producing potatoes, carrots, turnips, cucumber, tomatoes, cabbage, sweet corn and other staples. ...What must concern us is... the economic forces that may exist in the future to cause this land to be developed improperly. The future of agriculture in the Peace is equally important to other segments of government and to industry that must give it direction and support during its development. During the past 10 years, agricultural lands in the Peace River region have been brought into production at from 100 to 200 thousand acres per year... Undoubtedly the rate of development will continue to be substantial. We would expect that within a rather short period of time the point will be reached where a further 1 million acres are being brought into production every 4 years. ...Since bees are required for the pollination of legumes for seed and of canola, future development must be based on a well-coordinated honey production industry. And finally, we cannot visualize the future without at least moderate use of the preferred river valley locations for growing a wide range of horticultural crops including potatoes, carrots, turnip, cabbage, onions, corn, strawberries and raspberries. With intensification, a number of other vegetables and fruits could be grown. Other specialties may broaden the production base and benefit the whole industry.”</i></p> <p><i>Art Guitard, Director, Beaverlodge Research Station, Beaverlodge, Alberta. 1965</i></p>

Issue Gap Groupings	Selected Gap Examples (dominant EIS section reference)	Comments
<p>UNIQUE MICRO CLIMATE</p>	<p>The economic value of the unique Peace River Valley micro-climate is not recognized:</p> <ul style="list-style-type: none"> • <u>LSL Table 1 Climate for Agriculture GAP: No mapping of climate characteristics that would clearly identify those PRV lands with unique microclimate for horticultural (heat-loving) crop suitability (Vol 3 Sec 20.2.2.1)</u> <p>The economic effect of the impact of the reservoirs on the Peace River Valley microclimate is not recognized.</p> <ul style="list-style-type: none"> • <u>LSL Table 1 Climate for Agriculture GAP: Question interpretation of minimal impact of proposed reservoir (and past reservoirs?) on agricultural microclimate characteristics with respect to crop and enterprise choice, seeding/harvesting management, and soil moisture within LAA and RAA.</u> 	<p>This has the effect of underestimating bot the crop potential of the land today and the productive public value of the land in the future under a no-dam scenario.</p> <p><i>Unique microclimate agricultural lands, which have specific crop suitabilities, are not tracked throughout the impact analysis and therefore not identified as a specific aspect of agriculture land loss. (LSL Table 1. Assessment of Agriculture Land Loss GAP.)</i></p> <p>Changes in microclimate such as changes in temperature, precipitation, wind, humidity, fog etc. and their impact on farm management practices are ignored.</p>

Issue Gap Groupings	Selected Gap Examples (dominant EIS section reference)	Comments
<p>GLOBAL CLIMATE CHANGE</p>	<p>Climate change analysis is perfunctory and inadequate, and its implications for the Peace River Valley are dismissed. The economic implications of global climate change are not addressed.</p> <ul style="list-style-type: none"> • “Climate change predictions also indicate that climate capability within the region as a whole will improve, increasing the land capability for agriculture throughout the region. It is expected that the proportion of high capability land within the Project activity zone relative to the total within the region will not increase with climate change, and may decrease.” (Vol. 3. Sec. 2.2.2.1.5) • <u>LSL Table 1 Climate for Agriculture GAP: Confidence of climate interpretation for agriculture limited by reliance upon BC Hydro 1-year (2011) climate station data as the PRV component of the determination of 30-year climate averages, which are based on upland data in a different climate zone. (Vol 3 Sec 20.2.2.1.4 and Vol 3 Append D)</u> 	<p>The EIS implies the risk of global climate change is “significant” compared with local climate change (MIROCLIMATE) but does not factor this into scenario analysis.</p> <p><i>Estimate of changes in temperature were compared to expected changes due to global climate change. For most of the Technical Study Area the magnitude of predicted changes in microclimate would be statistically insignificant when compared to global climate change. EIS Vol 2 Appendix K</i></p> <p>What effect will global climate change have on local, regional and provincial food security options in the future? How will climate change impact the capability and crop suitability of Peace River farmland? How will climate change impact overall food production capacity of the provincial ALR? How will climate change impact food production strategies and options at the local, regional, provincial level? How will this change the relative importance of Peace River Agriculture?</p> <p>BC Agriculture’s Climate Change Action Plan 2010-2013 identifies the following broad changes for BC’s climate:</p> <ul style="list-style-type: none"> • <i>Increasing climate variation and more extreme weather events with an increase in the associated damage costs</i> • <i>Shrinking of glaciers with many expected to disappear within 100 years; resulting in serious impacts on water availability and hydrology</i> • <i>Reduction of snow accumulations, particularly at lower elevations</i> • <i>Warming by 2-7°C by 2080 – impacting sea levels, precipitation patterns and ecosystems</i> • <i>Increasing frequency and severity of wildfires</i> • <i>Increasing frequency and severity of pest, disease and invasive plant outbreaks</i> <p><i>“These changes are likely to have consequences for food production through impacts to health and quality of crops, pasture, forests and livestock. The biophysical changes are anticipated to result in socio-economic impacts which could also be felt in BC, even if the more dramatic changes to climate are occurring elsewhere. Potential impacts include: declines in yield and production, fluctuations in world market prices for food, changes in geographic distribution of trade regimes, and an increasing number of people at risk of hunger.... Despite the importance of maintaining a viable agriculture sector, to date the issue of agricultural adaptation to climate change has received little attention in BC. There is a critical need to determine how best to support the industry with climate change adaptation and how to increase food security in the face of a changing climate...”</i></p>

Issue Gap Groupings	Selected Gap Examples (dominant EIS section reference)	Comments
<p>DIRECT LOSSES TO FARMERS</p> <p>(Vol 3, 20.4; Table 20.37)</p>	<p><u>LAND LOSSES</u></p> <p>The EIS provides no evaluation of the economic (public) cost to mitigate and/or compensate farmers for LOSSES arising from the construction and operation of the proposed dam:</p> <ul style="list-style-type: none"> a. Lands impacted by construction, disrupted traffic patterns, transmission system (Temporary) b. Land flooded, lands lost to farming (Permanent.) e.g. at perimeter. <p>Mitigation and Compensation measures are inadequate. According to the EIS, mitigation for temporary losses will be based on implementation of management plans and compensation for permanent losses will include irrigation and drainage improvements, soil relocation, inclusion of land within the ALR and payments from the agricultural compensation fund.</p> <p>Islands created by the Project are not included in permanently lost land, yet may be removed from the productive land base due to economic costs to access.</p> <p>No mention is made of the economic impact of the loss of potential future crown grazing rights</p> <p>No mention is made of the economic losses arising from the restriction of management options (rights) on lands within and adjacent to stability impact lines.</p>	<p>Loss of land “cultivated in 2012” will be compensated at land value; in the case of severe impact, BC Hydro will consider requests from the farmer to purchase the farm. This is essentially expropriation. Also suffers from the baseline problem noted above, what was “cultivated” in 2012 may be a small percentage of productive but fallow land lost to flooding. How will this be compensated for?</p> <p>Compensation and mitigation will be based on-closed door negotiations between BC Hydro and the affected farm. Farmers will not know if they are being treated fairly or not.</p> <p>Loss compensation based on land value does not recognize the investment the farmer has placed in that land (soils and fertility, strategic importance within the farming unit) nor the economic value of its unique microclimate. Compensation should be based on annual profit each acre would generate when put to highest use over the life of farmer and the next generation.</p> <p><i>Some hectares of agricultural land that will be permanently loss are more valuable than others, partly due to unique microclimate characteristics and crop suitability... and partly due to the greater acreage of higher capability land identified through the more detailed mapping that was carried out. (LSL Table 1 Agricultural Compensation Package to address Residual Effects GAP)</i></p> <p>BC’s northern grasslands are amongst the most productive in Canada. Loss of access has economic consequences for individual farmers and for the sector.</p> <p>Statutory rights of way imposed across lands within and adjacent to stability impact lines will restrict farm management options (for example, prohibiting irrigation or machinery use) restricting farmers’ productive use of these lands.</p> <p><i>Implications of the preliminary stability impact line and associated statutory rights-of-way on ± 9600 ha have been seriously downplayed in the EIS, resulting in several key gaps...Other than building restrictions, no interpretation of the impact upon farm operations and opportunities (e.g. Restrictions on crop range, irrigation, livestock and farm machinery use). (Vol 3 Sec 20.3.2.1, Vol 2 Append C) (LSL Table 1 Impact upon Agricultural Land Use Within Preliminary Reservoir Impact lines GAP.)</i></p>

Issue Gap Groupings	Selected Gap Examples (dominant EIS section reference)	Comments
<p>DIRECT LOSSES TO FARMERS (cont'd)</p> <p>(Vol 3, 20.4; Table 20.37)</p>	<p><u>HIGHER FARM MANAGEMENT COSTS</u></p> <p>The EIS provides no measure of the economic (public) cost to mitigate HIGHER COSTS arising from construction and operation of the proposed dam (including but not limited to the following) nor an assessment of their cumulative effect:</p> <ul style="list-style-type: none"> a. Bisected operations, partitioned fields, new fencing and gates, changes to field drainage and irrigation, wildlife damage. b. Changes in soil and subsoil water flows (local hydrology and groundwater); impact of changes on irrigation capacity, management practices, cropping, farm returns. c. Changes in microclimate; changes to farm management practices arising from changes in temperature, precipitation, wind, humidity, fog. d. Slope Instability; impact of slides and slumping on field and farmstead management and public safety; loss rights associated with imposition of statutory right of ways within and adjacent to stability impact lines. e. Noxious weed contamination. f. Constraints on resiliency (capacity for strategic repositioning to take advantage of market opportunities) e.g. loss of heat-loving croplands, loss of isolation needed for organic seed crops. g. Farm worker safety. h. Increased transportation costs; due to scale, due to new road system, etc. i. Reduced isolation; intro of new pests/diseases. j. Loss of biodiversity and its impact on farm practices (e.g. IPM). k. Interference from non-farm uses. l. Loss of carbon sequestration income/capacity. 	<p>The EIS judges these costs to be insignificant.</p> <p>The EIS states BC Hydro will mitigate adverse effects through irrigation improvements and the development of Farm Mitigation Plans to include environmental management plans, traffic management plans, public safety management plans and biosecurity protocols if needed.</p> <p>With the exception of irrigation, all of the above are part of basic farm management planning. The only actual mitigation measure is irrigation. Further, many of the mitigation measures cited fall under sections of the EIS, which do not reference agriculture. (For more <u>LSL Table 1 Impact of Land and Water Use Change upon Agriculture GAP</u>)</p> <p>Mitigation will be based on-closed door negotiations between BC Hydro and the affected farm. (<u>Vol 3 Table 20.37</u>)</p> <p>The mitigation process should be open and transparent. Absent this, there is also no way to assess the equity of the mitigation/compensation paid area farmers who sustain such losses and/or higher costs.</p> <p><i>...Changes to livestock access and security and trespass management related to recreation use of the reservoir are complex issues not able to be addressed only on an individual farm operation basis. (LSL Table 1. <u>Impact of Land and Water Use Change upon Agriculture GAP</u>)</i></p> <p>Mitigation will be funded from of a yet-to-be-specified compensation and mitigation fund.</p> <p>Since funds by their very nature have a bottom, pressure for early settlements will be strong.</p> <p>Adverse effects of the Project will extend into the long term, yet there is no specification of the amount of the fund, nor its duration.</p>

Issue Gap Groupings	Selected Gap Examples (dominant EIS section reference)	Comments
<p>SECTORAL LOSSES</p>	<p>a. The assessment of land loss is based on unimproved land capability for agriculture, (Vol 3. 20.3.3.1; Table 20.16)</p> <p>b. No consideration is given to the economic cost to the sector of a loss of diversity arising from the loss of heat loving crops as a production option.</p> <p>c. No consideration is given to the economic impact of the proposed dam on agricultural infrastructure.</p> <p>d. No consideration is given to the economic impact of the proposed dam on farm demographics</p> <p>e. No consideration is given to the economic and social costs associated with depression, disempowerment, major shift in vision of the future.</p> <p>f. No consideration is given to the economic effects of how the project will impact personal and household wellness, security and happiness and the social and economic fabric of the community.</p> <p>g. No consideration is given to the economic impact of the loss of farmland in the Peace Valley on the resiliency and capacity of the provincial Agricultural Land Reserve.</p>	<p>This has the effect of underestimating the economic significance of the loss to the sector.</p> <p><i>This approach has the effect of reducing the loss of Class 1 agricultural land to 0 hectares, whereas adding up EIS-provided figures on hectares lost to individual project components based on improved ratings results in the permanent loss of 1547 ha of Class 1 agricultural land. (LSL Table 1: Assessment of Agriculture Land Loss GAP)</i></p> <p>EIS did not consider the unique microclimate of the Peace River Valley and its beneficial effect on soils and crops.</p> <p>What effect will a reduction in number of farmers and operating farms have on local infrastructure – for example farm suppliers, farm services, technical, financial, peer and community support?</p> <p>The construction of the dam limits the future for agriculture on some of the highest capability land in the province. This will reduce the number of young farmers entering the sector, impeding intergenerational transfer of farms and reducing sectoral resiliency.</p> <p>Does not value economic impact on farm community (losing neighbours, numbers, collectivity).</p> <p>The economic value of the unique Peace River Valley microclimate is not recognized by the EIS and consequently its importance to the provincial land reserve is also unrecognized.</p>

Issue Gap Groupings	Selected Gap Examples (dominant EIS section reference)	Comments
<p>LOSSES TO PUBLIC AND COMMUNITY</p>	<p><u>IMPACT ON LOCAL AND REGIONAL SPENDING, TAX BASE, JOBS AND ECONOMIC DEVELOPMENT</u></p> <p>a. Long-term impact on regional economy (loss of farmland over 50, 100, 150, 200+ years) is premised on artificially low baseline. (Vol 3 Table 20.31)</p> <p>b. Long-term scenario analysis is based on EIS collapsed “utility ratings” derived solely from land capability ratings.</p> <p>c. Model to estimate future benefits assumes static cropping decisions that undervalue economic potential of the land base.</p> <p>d. Inadequate sensitivity analysis. The EIS states base case valuation is most sensitive <i>to length of the period over which foregone benefits are calculated, area of vegetable production included and length of the period over which the full development of the agricultural potential of the Project activity zone is assumed to occur</i>, yet only undertakes perfunctory analysis of the first variable. (Vol 3. 20.3.8.6)</p>	<p>This undervalues potential benefits under “no dam” scenario (see BASELINE).</p> <p>This GAP makes accurate economic modeling of the “no-dam” scenario impossible.</p> <p><i>The unique microclimate of the PRV most directly manifests itself in crop suitability (unique opportunity to produce specific heat-loving crops) rather than land capability (which is a reflection of range of crops only)... No mapping of crop suitability was carried out and therefore this critical knowledge base is unavailable for interpretation. (LSL Table 1 Land Capability, Crop Suitability and Utility for Agriculture Interpretations GAP).</i></p> <p>The EIS uses 2011 baseline scenario and mechanically increases acres in each crop by 8-10% a year, adding one ha of vegetables per year. Further, there is no consideration of animal production (dairy, meat, eggs) in the scenario analysis. Absent the shadow of the Site C dam project, rational decisions by farmers can be expected to move the land to highest and best use. Given the Peace Valley’s unique microclimate (see MICROCLIMATE) and comparative advantage at serving regional and northern food demand, this would include the production of heat loving vegetables and berry fruits, potatoes, animal agriculture and the evolution of local processing and value added facilities.</p> <p>The fact that the model is sensitive to “area in vegetable production” and “rate of development” underscores the problems in the scenario analysis noted in this section. Absent the shadow of Site C, rational decision-making by farmers would be expected to increase agricultural diversity, the cultivation of heat-loving horticulture crops and the addition of animal agriculture and processing capacity to provide a local source of food to regional and northern communities. This scenario was never tested by the EIS.</p>

Issue Gap Groupings	Selected Gap Examples (dominant EIS section reference)	Comments
LOSSES TO PUBLIC AND COMMUNITY (cont'd)	<p>e. No consideration is given to the economic contribution arising from the potential growth and development of a locally-based value-added pre and post farm gate agri-business sector to provide services to, buy from, processes, and transform Peace Valley food products for local and export consumption.</p> <p>f. What is the justification for using a social discount rate (used to value economic impact of loss of farmland on regional economy over 50, 100, 150, 200+ years) of 3.5% for first 50 years, dropping to 2.5 in second 50-year period, 2% for the next 100- years, and 1.5% thereafter? (Vol 3. 20.3.8.6)</p> <p>g. Sensitivity to variance in the SDR of plus/minus 0.5% is inadequate. (Vol 3. 20-58-22)</p> <p>h. What is the justification for basing measure of economic activity lost (1.8 multiplier) on farm expenses not farm sales? (Vol 3. 20-61 line16)</p> <p>i. What is the justification for excluding family labour from job creation assessment? Impact of proposed dam on number of jobs created by the sector includes only hired labour. (Vol 3.20-61-23).</p> <p>j. Fails to adequately assess the economic impact of the withdrawal of these productive lands from the provincial foodlands reserve (the ALR).</p>	<p>In the early 60's, before the shadow of the dam fell across the land, there was a thriving agribusiness sector. (See BASELINE.) There is no reason to assume that this would not return if the shadow of the dam were lifted, farmers made rational economic decisions and the land moved to its highest and best use.</p> <p>A social discount rate of 3.5 is extremely high. Stern, in his respected <u>Review on the Economics of Carbon Credits</u> suggests a discount rate of 1.4% is far more appropriate. It is further questionable why the social discount rate is varied at the end of each 50-year period. (Paradoxically, it discounts the importance of the benefit in the first 50 years then assumes it will be of greater importance after that.)</p> <p>Basing the assessment of secondary economic activity only on projected expenses and not on projected gross sales understates the economic impact of a no-dam scenario. Basing it on farm receipts would increase the measure of economic activity by 2.27 times today and by 2.43 times a hundred years from now. Baseline issues continue to undervalue the magnitude of both projections.</p> <p>EIS notes for every one job created in primary agriculture there is 0.91 jobs created in the economy yet they exclude from calculation on-farm employment by family members, understating impact on job creation and economic activity.</p> <p>If the Site C dam goes ahead, will farmers have the critical mass, resources and natural capital to meet new challenges and potential? Resiliency of community to increase local supply, value added, co-ops,</p>

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<p>LOSSES TO PUBLIC AND COMMUNITY (cont'd)</p>	<p>k. Regional food resiliency ignored; provincial resiliency issues dismissed.</p> <p>l. Impact on local food security dismissed, citing globalization and increased trade as sufficient remedies:</p> <p>“The effects assessment concluded that there would be no adverse effect on food self-reliance for the Peace Agricultural Region”. (Vol 3. 20.3.13)</p> <p>“...there will be more than adequate land outside of the Project activity zone to meet self-reliance needs at least for the next 100 years.” (Vol 3. 20-65-29)</p> <p>“...There are no residual effects to the ability of the region to be food self-reliant in commodities that can be produced in the region, as there is sufficient land remaining for the region to be self-sufficient in these commodities.” ((Vol 3. 20.4.1)</p> <p>“...Canada supports fair trade rules and environmentally sustainable trade practices as the means toward increasing food security, rather than agricultural protectionism and promotion of food self-sufficiency. (Vol 3. 20-25-3)</p>	<p>How does loss of Site C lands impact resiliency of existing ALR, of ability to craft a sound provincial food strategy? <i>The Class 1 climate capability for agriculture lands within the PRV are the only Class 1 climate for agriculture lands north of Prince George. ... (LSL Table 1 Assessment of Agriculture Land Loss GAP)</i></p> <p>The crops that can be grown in the valley bottom are completely different than can be grown on the benchlands.</p> <p>This suggests a misunderstanding of what is meant by self-sufficiency and food security. The concern is not with “self-sufficiency” of crops being currently cultivated but the ability of the land to support a range of market garden crops and animal protein to provide food self-sufficiency</p> <p>Given climate change, peak oil and population growth, this simplistic statement flies in the face of good public policy. According to BC Agriculture’s Climate Change Action Plan 2010-2013:</p> <p><i>It is estimated that about between 40 and 50% of the food consumed in the province is imported and a significant percentage comes from California which has recently been experiencing severe drought conditions. As climate change impacts are felt in other jurisdictions, heavy reliance on imported food may become increasingly problematic and costly... There is a critical need to determine how best to support the industry with climate change adaptation and how to increase food security in the face of a changing climate</i></p>

Issue Gap Groupings	Selected Gap Examples (dominant EIS section reference)	Comments
<p>LOSSES TO PUBLIC AND COMMUNITY (cont'd)</p>	<p>m. Analysis is simplistic. From <u>Food Self Reliance in the Peace Agricultural Region: Vol 3, 20-26</u></p> <p>a. <i>“Overall, regional food self-reliance has not been examined in detail. Nonetheless, it is estimated that about 30% of the fresh-equivalent weight of vegetables consumed cannot be grown in the region; for fruits and berries slightly over 96% of the products consumed cannot be grown in the Peace Agricultural Region. At maximum, this means that the Peace Agricultural Region is capable of producing 41% of the total fruits and vegetables consumed</i></p> <p>n. The question of food accessibility (price) was not addressed, not impact of reduced access (price. supply) on local diet, nutrition and health costs.</p> <p>o. Impact on food security (supply, access), nutrition and health in the Northwest Territories and Yukon not considered.</p> <p>p. Economic impact of reduction in Natural Capital; (local, regional, provincial) not considered</p>	<p>What is the basis of this assumption? Interviews with local merchants? This again ignores the unique microclimate of the Peace river Valley and its ability to support a wide range of heat-loving crops. Further, The market basket of fruits and vegetables consumed is related to price. And price of non-local foodstuffs is related to transportation costs and market concentration. As price of imported goods rises, it is reasonable to assume consumption will shift to a more sustainable, local food basket. A similar argument can be made for animal production. Indeed, localism as the “new urbanism” is a trend sweeping many Canadian cities.</p> <p>If prices of nutritious foods escalate, what will happen to nutrition? What health outcomes can one expect?</p> <p>Need to understand existing supply lines to the North. Does PR have strategic advantage in nutrition? Quality? Price? What are the implications for PR farmers and for Northern Communities if this option foreclosed?</p> <p>Reducing natural capital reduces community resiliency.</p>
<p>CUMULATIVE EFFECT</p>	<p>There is no evaluation of the cumulative economic effect of potential impacts of the proposed project on the region and the province.</p>	<p><i>The accumulated impact on agriculture is much more than the sum total addition of land loss to reservoir taking and Statutory Rights-of-Way. It is the combined direct and indirect impacts of reservoir flooding, access and transportation planning, groundwater and surface water quality/quantity changes, land use changes and forced farm and ranch operation management modifications – both in the short and the long term. (LSL “Cumulative Effect” GAP.)</i></p>

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<p>RISK</p>	<p><u>ECONOMIC IMPACT NOT SUBJECT TO RIGOROUS SENSITIVITY ANALYSIS FOR RISKS, INCLUDING THE FOLLOWING:</u></p> <ol style="list-style-type: none"> 1. Risk of climate change 2. Risk of fossil fuel price escalation; (transportation costs) 3. Risk of escalating population 4. Risk of market failure (increasingly concentrated markets) 5. Risk of increased slumping. 6. Risk of shrinking food land base; foreign buy up of farmland for food export or bio-fuels 7. Risk of food becoming more valued than energy exports. 	<p>The EIS implies the risk of global climate change is “significant” compared with local climate change (CLIMATE) but does not factor this into cropping options in scenario analysis to value the loss of agricultural land should the project proceed.</p> <p>Deemed insignificant –rest of region can respond if necessary. Does not consider impact of transportation on food prices, nutrition and health care cost</p> <p>The EIS modeling pegs population growth at 1.09% per year. Both BC and Alberta are experiencing higher job growth due to resource extraction. BC grew at 7.0% over the past 5 years, Alberta by 10.8% and Edmonton by a whopping 12.1%. Energy exploration in the Peace should peg growth rates closer to Alberta. EIS population growth estimates almost certainly underestimate the demand for food in the region. Further, there is no consideration given to populations in the Yukon and NWT.</p> <p>Does not consider increasing trend towards market concentration and impact on food prices, nutrition and health care cost.</p> <p><i>Implications of the preliminary stability impact line and associated statutory rights-of-way on + 9600 ha have been seriously downplayed in the EIS (LSL Table 1 Impact Upon Agricultural Land Use Within Preliminary Reservoir Impact lines GAP)</i></p> <p>Does not consider importance of the Peace River Valley land to the diversity, capability and resiliency of the provincial ALR.</p> <p>What are the public options if the land is needed in future for food production? Does not consider potential future cost of dam decommissioning.</p>