

Food security, food sovereignty, and the agricultural supply chain in Newfoundland and Labrador

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Presentation Highlights

I. Defining **food security & food sovereignty**

II. Is NL **food secure? Food sovereign?**

Results and context from 2011 Ag Census

Summary of contemporary literature

III. NL agricultural research: next steps

Emerging agricultural economic research

Boreal Ecosystem Research Initiative (**BERI**)



Food security vs. food sovereignty: What's the distinction?



Food Security: Common Definitions

- “Secure access to enough food all the time”.
- “The inability to obtain sufficient, nutritious, personally acceptable food through normal food channels or the uncertainty the one will be able to do so.” (Davis and Tarasuk, 1994; Hunger in Canada)
- “Access at all times to enough food for an active, healthy life for all household members.”
(Nord et al., 2010; U.S. Department of Agriculture)
- Definition varies across disciplines, scales, “scapes” (local, regional, national, international)

Food Security is a “Public Good”

By definition, the market fails to provide socially optimal prices and quantities

What level of market intervention is necessary to encourage market development?



Food Security: NL Literature

- **Kristen N. Lowitt (2009, 2013, 2014)**
 - “A Community Food Security Assessment of the Bonne Bay Region”.
 - Qualitative interviews and food costing
 - Concludes there is food insecurity in rural regions
 - Examines “foodscapes” & socio-ecological interactions in western NL food systems (e.g. fish)
- **Community engagement and education efforts**
 - Food Security Network NL (ACORN)
 - FRESH

Food Insecurity: Contributing Factors

- Diffuse population (rural communities)
- Environmental, natural resource, or ecosystem limitations or endowment
 - Examples: Poor soil quality, climatic variance, lack of ecosystem diversification
- Low income
- Lack of infrastructure (roads)
- Distance from agricultural production centers
- Institutional barriers (trade)
- High production costs

Island Economies Are Vulnerable to Food Insecurity

But can provide a
comparative advantage
in some products



Food Sovereignty

- **Local access to food supply**
- Emerging humanities/political science literature
 - “Quiet food security”
 - “Food insecurity in a sovereign state”
 - Journal of Peasantry Research Special Issue (10/2014)
- Ensuring adequate local access to food, irrespective (or in spite) of large scale commercialization or commodity production



Food Sovereignty

- Implies market impediments to local food supply
 - Examples: Higher prices for exports, policies, politics
- Consistent with foodscape/food system literature
- Opportunity for further economic study
 - Demand side factors?
 - Tastes and preferences?
 - Substitution vs. Income Effect?
 - Small scale supply chain



Is food sovereignty different from food security?



Can NL achieve food sovereignty and not food security?



Food Sovereignty vs. Food Security

- **Supply-side** and supply chain perspective:
 - Is there enough market demand for farms and retailers to make a profit and remain in business?
 - Is the supply chain (inputs, commodities, distribution) available to produce a cost competitive product?
 - Is there a comparative advantage for NL products?
- **Demand-side** perspective:
 - At what price point will consumers substitute to different products? (Imports? Local production?)
 - Is there a willingness to pay a price premium for locally grown products, local supply chain?

Supply Side: NL Ag Production Trends

- Number of **farms declining, revenue increasing**
 - Large farms defined: >\$500,000 annual receipts
 - 510 farms in 2010, -8.6% from 2006; -10.3% nationally
 - Gross farm revenue +11.5%; +3.9% nationally
- Farm **acreage declining**
 - -13.5% in NL; -4.1% nationally
- Percentage of **large farms increasing (48 total)**
 - By percentage, large farms +4.3%; small farms -9.8%
- Majority of **farm revenues from large farms**
 - Large farms =9.4% of all farms, but 80.4% of revenues

NL Ag Production Trends

- As proportion of budget, **NL producers spend 67% more on feed than national average**
 - High costs attributed to cooler seasons, less forage
 - Increased >10% from 2005
 - Feed expenditures comprise \$0.40 per \$1.00 spent
- **High provincial disparity** for feed expenditures
- **Crop co-production off-sets costs ~5%**
- **Producer cost revenue ratio unchanged from '05**
 - Ave. operating expenses = \$0.86/\$1.00 receipts

Canada 2006 and 2011 Census of Agriculture:

<http://www.statcan.gc.ca/pub/96-325-x/2014001/article/14084-eng.htm#a2>

Summary and Conclusions: NL Ag Production Trends

- Higher revenues , unchanged cost ratio
 - Implies **improved cost efficiency, value added**
- **Producers pass costs to consumers**
 - We all consume food, and pay higher overall prices
 - How do price changes affect household demand?
- NL agricultural production at a crossroads
 - Increased farm size, efficiency; less market penetration
- Key to growing NL ag sector: build value, reduce operating costs, and cultivate supply chain

Why Should We Concern Ourselves With Building the NL Agricultural Sector?

**Higher prices for producers → More profit
Profit to commercial producers is, arguably,
a necessary but not sufficient condition for
food security.**

NL Agricultural Demand Studies

Context: Price Premiums

**Would consumers be willing to pay
price premiums for food security?**

Organic and Pesticide-Free

- Numerous Canadian studies on perceived health & environmental benefits
 - Mix of confusion, favor, skepticism & higher demand
- Consumers WTP price premiums for organics
 - Already buying organic? More likely to pay even more
 - Price premiums unpredictable, avoid redundancies
 - Organic chicken breasts different from organic potato chips
 - Less likely to pay organic premium at farmers' markets
- Maritime consumers WTP 10% price premium

Larue, B. et al. 2004. Consumer response to functional foods produced by conventional, organic or genetic manipulation. *Agribusiness* 20(2): 155-166.
Berglin, M. and McNamara, M. 2007. Journal of International Food & Agribusiness Marketing., 19(4): 45-59.

NL Demand for Pesticide Free Produce (Haghiri, 2011)

- **Sampled 222 respondents in eastern and western Newfoundland shopping centers in Winter 2007**
 - **Sample consistent with demographic data**
- **66% of consumers willing to pay 5% price increase for organic produce over conventional**
- **74% believed pesticides hazardous to health**
- **81.1% believed pesticides hazardous to environment**
- **63% visited farmers' markets in past 5 years**

Haghiri , M. 2011. Consumer Perceptions of Environmentally Friendly Products in Newfoundland and Labrador. *Journal of Food Distribution Research* 42(2).

Willingness to Pay Price Premium

- **Likelihood to pay 5% price premium:**
 - Increased 30% if married
 - Increased 20% if college graduate
 - Increased 31% if believe insecticide-free linked to health benefits
- **Habit of buying pesticide free** is an indicator of willingness to pay 5% price increase
 - 51% more likely to pay price premium
 - Consistent with other studies (Govindasamy and Italia, 1999; Batte et al., 2004)

Haghiri , M. 2011. Consumer Perceptions of Environmentally Friendly Products in Newfoundland and Labrador. Journal of Food Distribution Research 42(2).

Eco-labeling and NL Demand for Certified Farmed Atlantic Salmon (Haghiri, 2014)

- Perceived value of Canadian Food Inspection Agency (CFIA) certification and reduced polychlorinated biphenyls (PCB)
 - Traceability linked to health benefits and environmental accountability
- 120 telephone interviews, stratified by 4 regions
 - 69.1% concerned about PCB; didn't slow consumption
 - Interviewees consumed 1 lb./wk. on average, compared to 4.5 lbs. annually (national average)
- 67% stated WTP 15% price increase for CFIA
 - More likely to pay if consume 2-4 lbs./week
 - Less likely to pay if freshness more important

Haghiri , M. 2014. An evaluation of consumers' preferences for certified farmed Atlantic salmon. British Food Journal 116(7): 1092-1105).

**Demand Side: Consumers
more likely to pay price
premiums for perceived
benefits**

Conclusion: Consumers more likely to pay price premiums for perceived benefits

**Consumers might experience short-term price
increases for NL-grown products.**

Conclusion: Consumers more likely to pay price premiums for perceived benefits

**Consumers might experience short-term price
increases for NL-grown products.**

“Cost of agricultural food security”.

Conclusion: Consumers more likely to pay price premiums for perceived benefits

**Consumers might experience short-term price
increases for NL-grown products.**

“Price of agricultural food security”.

**Is it worth the price premium to create NL
jobs and economic diversification?**

Conclusion: Consumers more likely to pay price premiums for perceived benefits

**Consumers might experience short-term price
increases for NL-grown products.**

“Price of agricultural food security”.

**Is it worth the price premium to create NL jobs
and economic diversification?**

**Would consumers substitute and rely on their
own production?**

NL Agricultural Research

Next steps to evaluating some of
these questions



Catherine Keske, Ph.D. Associate Professor Agricultural and Forestry Economics

3-Yr. BERI Socio-Economic Research Plan

Year Three 2016-2017

- Quantify market-level and macro-economic impacts of BERI technologies
- Refine and expand macro-economic models and sustainability index

Year Two 2015-2016

- Develop macroeconomic models (e.g. CGE) to evaluate contributions of agriculture & forestry to NL economy
- Conduct risk analysis of pilot scale BERI technologies
- Aggregate provincial data to create sustainability index and/or income accounting metrics

Year One 2014-2015

- Quantify NL food security and food sovereignty (consumer demand, supply chain)
- Add economic and social science dimensions to BERI projects
- Conduct enterprise budgeting and sensitivity analysis of energy and forestry projects

Economic Feasibility of Potential Crops/Cropping Systems in Newfoundland and Labrador: A Preliminary Analysis



Boreal Ecosystem Research Initiative

Creating synergy in agricultural and forestry
research

Collaborating with well-respected
provincial and federal programs

Expanding education in agricultural and
forest research

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Dr. Mumtaz Cheema



Research Interests:

Abiotic stress management, Sustainable agriculture, Integrated nutrient management practices, Improving nutrient use efficiency [(N losses in cropping systems, emission of GH gases, nitrogen fertilizers, NI's and biological nitrification inhibitors in diverse genotypes (BNI's)].

Current research project:

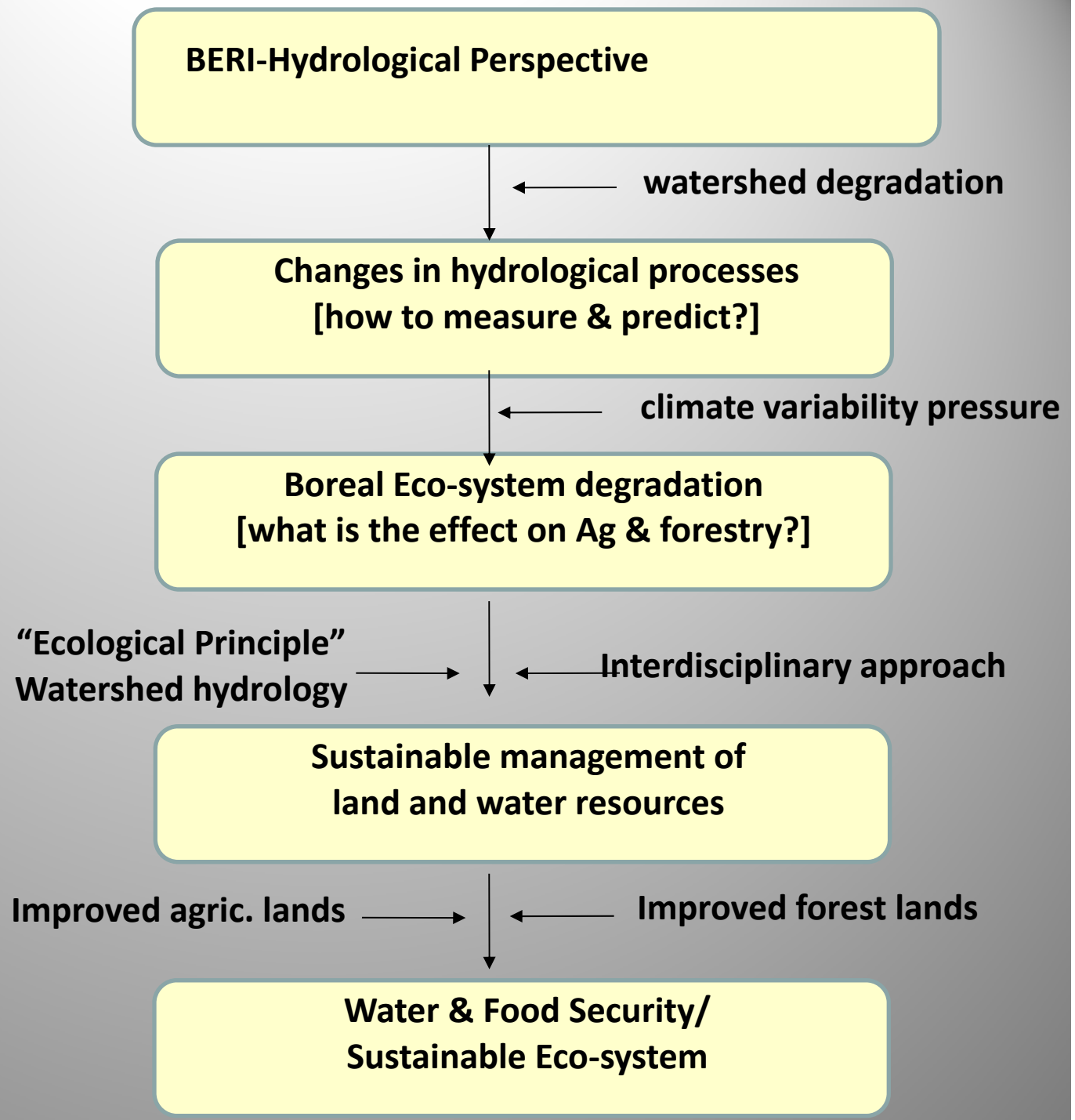
Biomass Production and Phosphorus Availability from Dairy Manure in Silage Corn.

Submitted:

Potential of biological nitrification inhibition in mitigating greenhouse gas emission and nitrogen use efficiency in silage corn genotypes.



**Dr. Lakshman
Galagedara**



Dr. Raymond Thomas

I use specialized analytical techniques:

- Chromatographic
 - Liquid, thin layer, gas and column chromatography)
- Mass spectrometry
 - ESI-MS, GC-MS/FID, DESI-MS
- Study roles of lipids and antioxidants in stress response in a variety of systems
 - Food science, agriculture, neurobiology, microbiology, plant/animal and insect/physiology



Dr. Raymond Thomas

Research interests/ themes

- Use of nanotechnology to enhance plant performance
- Develop novel techniques (chromatography, mass spectrometry, spectroscopy) to understand the roles of lipids in plant stress biology
- Secondary plant metabolites as functional food components (antioxidants and lipids)



Dr. Adrian Unc

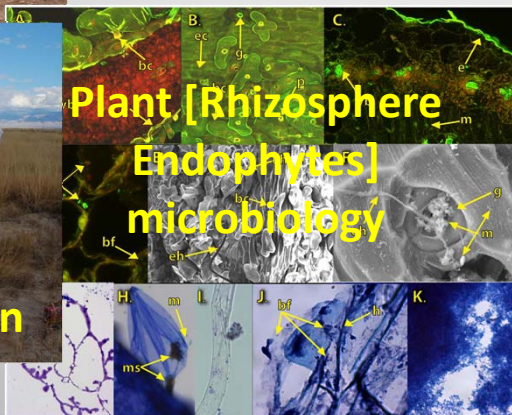
Soil / Plant / Water
Nutrients / Sustainability / Risk



Soil – plant interactions



Land use change
Climate change
Carbon sequestration



Waste treatment



Waste as resource
Biofuels



Waste as resource
Cropping systems



Coal

Land degradation
and remediation



Oil



Gas



RISK



Surface & ground
water water quality

Hydrology of
[soil]
unsaturated zone

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