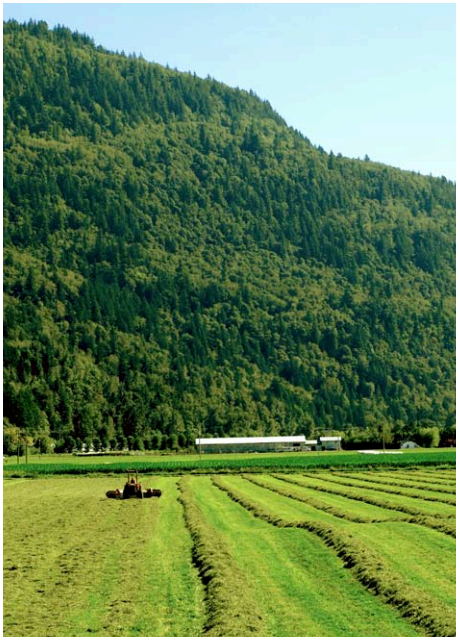
Climate Justice Project

Every Bite Counts

Climate Justice and BC's Food System



by Marc Lee, Herb Barbolet, Tegan Adams and Matt Thomson

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CCPA
CANADIAN CENTRE for POLICY ALTERNATIVES
BC Office

EVERY BITE COUNTS: CLIMATE JUSTICE AND BC'S FOOD SYSTEM

By Marc Lee, Herb Barbolet, Tegan Adams and Matt Thomson

November 2010

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Summary

THE ABUNDANCE OF THE MODERN SUPERMARKET is the ultimate product of a post-WWII food system based on industrial-scale agriculture, cheap fossil fuels and global trade. Examining our food through a climate change lens, however, suggests a rethink is in order —from reducing the greenhouse gases produced throughout the food system, to making the food system resilient to supply disruptions. BC also needs to develop a more just distribution of food, better support farmers, farmworkers and fishers, and seek healthier nutritional outcomes from our food system.

Examining our food through a climate change lens suggests a rethink of BC's food system is in order. Fortunately, the province is in an excellent position to move forward.

This is not a task that can be left to market forces alone. It calls for a more coherent planning framework at all levels of the food system. The supermarket cannot ensure food security, which according to the Community Nutritionists Council of BC, "exists when all community residents obtain a safe, personally acceptable, nutritious diet through a sustainable food system that maximizes healthy choices, community self-reliance and equal access for everyone."

Such a systems approach to food is becoming widespread in BC and other jurisdictions. BC is starting in an excellent position to move forward, with most domestic food production occurring on small farms, while ties to local markets have been strengthening through initiatives like weekly farmers' markets, community shared agriculture projects, and home delivery services. BC also has the Agricultural Land Reserve (ALR), although its erosion in recent years is cause for concern. These ingredients point towards a food system that could be, with strong public policy actions, just and sustainable.

ADAPTATION AND SELF-RELIANCE

The food crisis of early 2008 painted a potentially dystopic future of increasing food shortages due to (among other factors) accelerating climate impacts. While we do not know exactly how climate change will affect global food supplies over the next few decades, we have good reason to be concerned that a warming world will be one that systematically affects crop yields due to changes in precipitation patterns and higher temperatures, plus periodic extreme weather events, diseases and insect infestations that will hammer global supply chains.

BC imports about half of its food, making the province vulnerable to food supply disruptions and price spikes. A top priority is for a BC food planning framework that enhances resilience and self-reliance, while reducing dependence on imports and large global agribusiness. This must be balanced against the benefits of trade in providing a variety of foods and a diversified food supply, and that guards against domestic disruptions due to climate change.

If BC could shift just 1.5% of its overall consumption per year to local sources, the province would supply 80% of its food needs by 2030.

A food planning framework must include targets related to BC production for the domestic market to be effective. If BC could shift just 1.5% of its overall consumption per year to local sources, the province would supply 80% of its food needs by 2030. Based on projected population growth, achieving this target will require a doubling of production from current levels.

Farmers are the only part of the BC food system that do not have a high degree of corporate control. That market power means farmers are often squeezed in the middle, often receiving only a small fraction of the retail sales price. History has demonstrated that public or cooperative institutions in support of domestic production can benefit farmer incomes as well as matching supply and demand. Although not without its problems, this is clearly the case in the supply-managed areas of BC agriculture (dairy, eggs and poultry), a model—with added transparency and accountability—that could be implemented for fruits and vegetables, meat and other products.

In addition, wages and working conditions for farmworkers should be improved. An increasing number of farm workers in recent years have come into the province as temporary migrants, leading to the bizarre outcome that the aspirational 100 Mile Diet could be made possible by imported workers from as far as 3,000 miles away. Improving wages and working conditions for these workers (and giving them a real path towards citizenship) must be part of a new deal for farms. Public or cooperative institutions can improve incomes for both farmers and workers.

The Agricultural Land Reserve is a tremendous asset that other jurisdictions in Canada do not have. Removing productive farmland from the ALR to build highways and new sprawling suburbs is incredibly short-sighted. More farmland, if anything, will be required to accommodate a larger population, and challenges to the land base arising from climate change (a higher percentage of land may be made unproductive in any given year due to flooding or extreme weather events). Bolstering the ALR would also serve a double purpose as urban containment, facilitating the transition to "smart growth" or more sustainable and compact communities in urban centres.

Alternative supply networks have grown rapidly in recent years (including farmers' markets, Community Shared Agriculture, and home delivery services) but still represent a very small share of the market. Proposals such as the New City Market food hub would serve to remove bottlenecks in processing, storage and other ancillary services in support of local farms.

The development of local and sustainable food systems can also be supported by leveraging the purchasing power of large public and non-profit institutions in urban areas, including schools, hospitals, universities, prisons, and social housing units. If a growing portion of food budgets in the public sector were dedicated to local food sources, the multi-million dollar impact would be transformational in creating a more localized food system.

A new sustainable approach to the harvesting of seafood that supports workers and communities is also needed. Creating significant marine reserves to help restore some lost stocks and ecosystems, and a return to small-scale fisheries could provide numerous benefits, including job creation, local control, reduced fossil fuel consumption and less pressure on increasingly threatened fish stocks. New models for small-scale fisheries could include the fishing equivalent of Community Shared Agriculture initiatives by linking local fishers to urban consumers (the first of its kind was started in Vancouver in 2009).

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MITIGATION AND SUSTAINABILITY

Food production is also a contributor to climate change—the greenhouse gas (GHG) emissions associated with food production in BC, and through our imports of food from other jurisdictions. While official statistics put agriculture well down the list of global warming culprits, these numbers count only a portion of agriculture's footprint. If we add in fossil fuels used on BC farms and in tractors, the transportation of fertilizers and feed to the farm, and the movement of product to market, GHG emissions from agricultural production in BC are much higher. From a consumption perspective, which adjusts for imports and exports, emissions from the food that British Columbians eat total about 6 million tonnes of carbon dioxide equivalent, almost triple the official estimate.

As in other parts of the economy, phasing out fossil fuels will be needed from BC's agriculture sector, including:

- Shifts in technology on farms and in the field. This is likely to be electrification, with limited and local use of biofuels (from farm organic wastes, that is; conversion of farm land to growing crops to be used as biofuels elsewhere should be avoided).
- Breaking from the industrial food chain, which uses fossil fuels to manufacture and transport synthetic fertilizers.
- Use of lower-emission modes of transportation (planes and trucks are the highest emission modes), and reduce overall distances that food travels.

Shifting to sustainable agriculture also requires coming to grips with non-fossil fuel sources of emissions. For crop production, the application of synthetic fertilizers and pesticides generates substantial GHG emissions. These can be mitigated through switching to organic and mineral fertilizers and by using composted animal manure in integrated farming operations. Organic practices build up the soil over time, and thus have great potential to mitigate the GHGs associated with food production. Because soils and plants can remove carbon dioxide from the atmosphere, enhancing the role of BC agricultural lands as carbon

"sinks", including greater growth of perennial plants and through the addition of organic matter to soil, needs to be front and centre.

Livestock emissions are also a major part of GHG emissions associated with food. Cattle, in particular, produce large amounts of methane in their digestive processes. From a nutrient management standpoint, grazing cows for beef could reduce food system emissions if their manure is managed properly. Reducing the demand for meat would also allow for pastured animals, eating what nature designed for them to eat and returning to the land the untainted fertilizer the land requires.

FOOD DEMOCRACY AND FAIRNESS

Food democracy challenges corporate structure and control of food, and goes beyond the adequacy of food supply, to stress "decency and social justice in the food system's wages, working conditions and internal equity."

The term "food democracy" was coined by the UK's Tim Lang, and refers to the struggle "to ensure that all have access to affordable, decent, health-enhancing food." This concept challenges corporate structure and control of food, and goes beyond the adequacy of food supply, to stress "decency and social justice in the food system's wages, working conditions and internal equity."

BC is afflicted by hunger among its poorest citizens. Food insecurity, in addition to physical consequences, can also have a negative effect on psychological and educational outcomes for children and social functioning in adults. Community-based food initiatives—including food banks and a range of other institutional and community resources—represent an inadequate front line in Canadian responses to food insecurity.

An over-arching concern in a shift towards a more sustainable and resilient food system is the potential impact on the cost of food. The 2008 surge in prices for basic staples revealed potential vulnerabilities down the road. Existing inequalities in society are likely to be exacerbated by climate change and by climate policies—if those inequalities are not actively considered in the design of policies.

Because adequate access to healthy food is deeply linked to its cost, any price increases in food will result in greater food insecurity and/or increased malnutrition for vulnerable populations, both in Canada and abroad. Addressing income security is therefore a key component of meaningfully addressing food security in Canada and BC. The concept of a living wage is one important piece, as individuals and families need to be able to earn enough income from work to afford decent, healthy food.

Historically, policy approaches to food, housing and health have occurred in silos—and been characterized by policy failures. Currently, taxes pay for the societal costs of food insecurity and poor nutrition though the health care system. A more integrated approach to housing and food would also make great advances in reducing hunger, improving nutrition and health outcomes, while reducing numbers at the emergency room door. New investments in social housing are needed in BC, including supported housing models for people with health, mental illness and/or addiction issues, as well as affordable housing options for the working poor. Coordinating food programs in social housing in support of local, sustainable agriculture has great potential for win-win outcomes through bulk purchasing, community kitchen and meal programs.

That said, barriers to food security for marginalized populations are numerous and complex. In addition to income, challenges include the absence of nearby grocery stores selling fresh and nutritious food, travel costs associated with accessing distant grocery stores, lack of food preparation and storage on-site. Developing nutritious food programming for individuals who suffer from mental health issues, addictions and disabilities must be sensitive to the needs and capabilities of particular individuals.

RECOMMENDATIONS

Many of the issues we raise in this paper are being studied at the regional and municipal levels in BC. However, key policy levers are provincial in nature. We therefore recommend the following steps be taken by the BC government:

A top priority is a climate and food planning framework for BC's food system to be more just, resilient to climate impacts, and sustainable in terms of greenhouse gas emissions.

1. DEVELOP A PROVINCIAL CLIMATE AND FOOD PLANNING FRAMEWORK. A top priority is a rethink of BC's food system to be more just, resilient to climate impacts, and sustainable in terms of greenhouse gas emissions. The framework should build on food planning initiatives underway in Metro Vancouver and other parts of BC, and should set targets and timelines for local self-reliance, food system GHG emissions, hunger and nutrition.

2. SHIFT TO 80% FOOD SELF-RELIANCE BY 2030. To be more resilient to climate impacts, BC should steadily increase production for the domestic markets. This will require shifting domestic consumption away from imports, while ensuring balanced trade arrangements to guard against domestic supply disruptions.

3. IMPLEMENT NEW INSTITUTIONAL ARRANGEMENTS. A range of options, such as supply management or cooperatives, are possible to bolster BC's self-reliance and to ensure that agriculture is an economically viable activity. Farmers, distributors and other stakeholders should be engaged in developing the parameters for new institutions.

4. STRIKE A BETTER DEAL FOR FARMWORKERS. Wages, housing and working conditions for farmworkers also need to be improved. The growing numbers of migrant workers should also have opportunities for citizenship.

5. PROTECT AND EXPAND THE AGRICULTURAL LAND RESERVE. Removals from the ALR should cease immediately. Opportunities to bring in additional land under protection should be seized.

6. LINK LOCAL FOOD TO URBAN INSTITUTIONAL BUYERS. Channeling provincial public sector procurement is an essential means of scaling up local, sustainable food. A steadily growing percentage of food budgets should be allocated to the sourcing of local food, and these budgets should also be grown over time. Schools, in particular, are an ideal place to make the connections between community gardens, local agriculture, nutrition, and meal programs.

7. CREATE SUPPORTIVE INFRASTRUCTURE. Strategic interventions can assist small producers to overcome barriers to meeting local demand. Investments in food precincts and hubs, local processing facilities, local abattoirs, food storage and coordinated transportation networks would all foster the development of a local, sustainable food system.

8. DEVELOP A NEW FRAMEWORK FOR SUSTAINABLE FISHERIES. As in agriculture, supportive institutions are needed for fisheries, both in terms of the long-term viability of wild fisheries, and to ensure stable incomes for fishers. Developing robust connections to local markets is a priority.

Investments in food precincts and hubs, local processing facilities, local abattoirs, food storage and coordinated transportation networks would all foster the development of a local, sustainable food system.

9. EVALUATE AND SUPPORT RESEARCH IN GHG EMISSION REDUCTIONS IN AGRICULTURE. Direct support for research on GHG mitigation through alternative agricultural practices, specific to the BC context, is needed (for example, UBC Farm). There are also opportunities to pioneer clean energy alternatives to fossil fuels in agricultural buildings, machinery and equipment.

10. TAKE HUNGER OFF THE TABLE. A range of tools are needed to raise the incomes of low-income households. Ensuring workers can earn a living wage and adequate income support programs are essential to reducing hunger. These calculations should explicitly consider food price changes that may arise from the transition to more localized and sustainable food production.

11. SUPPORT INTEGRATED FOOD, HOUSING AND HEALTH PROGRAMMING. Breaking out of silos presents great opportunities to improve the health and quality of life of vulnerable populations. Housing programs should build in flexible food options and infrastructure that meet the social, cultural and nutritional needs of their residents.

PART 1

Introduction: An Inconvenient Tooth

THIS PAPER CONTEMPLATES THE LINKAGES between climate change and social justice as they relate to BC's food system—how we produce, process, transport and deliver food to households, including the inputs into production, and pollution and wastes at all points throughout. While the overabundance of food at the supermarket points to the success of a modern food system based on industrial-scale agriculture, cheap fossil fuels and global trade, that system is neither environmentally sustainable nor socially just.

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Climate change notwithstanding, the dominant industrial food system has increasingly become the subject of discontent: nutritional shortcomings of fast food restaurants and highly processed foods; outbreaks of diseases like e.coli; environmental impacts of pesticides and fertilizers; genetically-modified corn and soy crops; and, the excessive market power of a handful of global corporations over the production and distribution of food products.[1] Moreover, a social justice lens shows critical shortcomings related to hunger, nutrition and health, and the incomes of farmers and agricultural workers.

Responses to these ills can be seen in the growth of organic produce, free-range poultry and grass-fed beef, and through alternative food distribution networks like health food stores, farmers' markets, community kitchens, and community-shared agriculture projects that link urban consumers to local farms. While these alternative developments are not mutually exclusive from the industrial model—organic produce, for example, can feed into global supply chains and perpetuate poor wages and working conditions for farm workers—a broader consciousness around food is emerging that bridges people working on nutrition, the right to food, the 100-mile diet and sustainable agriculture practices.

1 See, for example, M. Pollan, *In Defense of Food: An Eater's Manifesto* (New York: Penguin Press, 2008); E. Schlosser, *Fast Food Nation: The Dark Side of the All-American Meal* (New York: HarperCollins, 2002); or the film, *Food Inc.* (2008).

The particular challenges posed by climate change are twofold. First, the global food supply chain is a major source of greenhouse gas emissions, an ecological cost of food not counted in the sale price. From fossil-fuel-intensive fertilizers to transport of food over long distances to energy-intensive processing facilities, the carbon footprint of our food is larger than many realize. Second, the climate appears to be biting back—a warming planet has the potential to affect food production in BC in myriad ways, and perhaps more importantly, our future ability to import food with such ease and abundance from California, Mexico and China.[2] In the absence of good planning, climate change is likely to exacerbate the existing social justice issues related to food.

The global food crisis of 2007 to early 2008 painted a potentially dystopian future of growing food shortages from accelerating climate impacts, accompanied by social unrest and rioting.[3] By March 2008, wheat prices were up 130%, soy 87%, rice 74%, and corn 31%, compared to a year earlier.[4] While prices eased through the rest of 2008 and 2009, the crisis highlighted the vulnerability of the global food system, and made food security a top-of-mind issue in many countries. In 2010, a drought in Russia prompted the country to impose an export ban on wheat, and has led to a major increase in global wheat prices in the face of reduced output.[5]

About half of the food consumed in BC is produced in the province, making BC vulnerable to price and supply shocks. But even without climate change, transporting food such large distances is not sustainable.

About half of the food consumed in BC is produced in the province,[6] making BC vulnerable to price and supply shocks. But even without climate change, the cost of transporting food such large distances is poised to rise dramatically as global oil production declines (the world is already at, or close to, peak oil production).

BC's resilience (or capacity to withstand shocks) to these events rests on an assumption that we can buy our way out of food price spikes, as was the case in 2008. On the other hand, the fallout from higher food prices will disproportionately affect the most vulnerable members of our society, including low-income households who cannot afford to pay more for their food. After decades of rising inequality there is cause for concern in BC's extremes in access to food: food banks coexist with posh restaurants, and expensive organic produce is stacked next to cheap junk food. BC's food system fails the key test of food security, which according to the Community Nutritionists Council of BC, "exists when all community residents obtain a safe, personally acceptable, nutritious diet through a sustainable food system that maximizes healthy choices, community self-reliance and equal access for everyone."[7]

We argue for a rethink and redesign of BC's food system. Already, regional and municipal initiatives are seeking to develop planning frameworks for local food systems (most prominently, Metro Vancouver's Regional Food System strategy[8]). These initiatives would be greatly

2 A. Ostry, *Food for Thought: The Issues and Challenges of Food Security*, Provincial Health Services Authority, August 2010.

3 "Riots, Instability Spread as Food Prices Skyrocket," reported by CNN, April 14, 2008, www.cnn.com/2008/WORLD/americas/04/14/world.food.crisis/.

4 "The Cost of Food: Facts and Figures," compiled by the BBC, http://news.bbc.co.uk/2/hi/in_depth/7284196.stm.

5 "Global wheat prices likely to shoot up," *Economic Times of India*, August 28, 2010, http://economictimes.indiatimes.com/markets/commodities/Global-wheat-prices-likely-to-shoot-up/articleshow/6448871.cms.

6 BC Ministry of Agriculture and Lands, *BC's Food Self-Reliance: Can BC's Farmers Feed Our Growing Population?,* 2006.

7 Community Nutritionists Council of BC, *Making the Connection: Food Security and Public Health*, Submitted to the Ministry of Health Services and the Health Authorities of BC, June 2004.

8 At the time of writing, the Metro Vancouver strategy is in draft form: www.metrovancouver.org/planning/development/RegionalFoodSystems/Pages/default.aspx.

complemented by provincial actions to accelerate the transition away from industrial agriculture and the global supply chain. While BC's Agriculture Plan, released in 2008, speaks to the need for a more localized food system and sustainable agriculture practices, the plan is short on details about how such objectives would be realized (and does not consider food democracy and fairness issues at all). BC's agricultural industry has also stepped forward with an agenda to investigate climate change impacts on the industry.[9] Our paper hopes to contribute to a growing dialogue at the provincial level, and to ensure that social justice considerations are not overlooked. A BC plan must emphasize decent livelihoods for farmers and farmworkers, ranchers and fishers, and ensure all British Columbians can access a healthy diet.

Such structural change is not a task that can be left to market (or supermarket) forces alone; it requires collective action. The BC government needs to play a leadership role in the development of a more coherent planning framework at all levels of the food system, in collaboration with local governments and communities. This is a daunting task. We aim to take one small step forward by outlining the key climate justice issues involved in food planning for BC, and some promising elements of a comprehensive and holistic framework.

We focus on three fundamental dimensions of the food system to explore future directions:

- ADAPTATION AND SELF-RELIANCE — If BC can shift from massive food exports and imports to a more localized food system, it will be fundamentally more resilient, and less vulnerable to food supply disruptions and price spikes (although we recognize that a completely localized system also carries risks that can be hedged through trade). Beyond climate impacts directly, the peaking of oil production may lead to dramatically higher costs of importing food over the coming decades.[10] Planning for a food system that strengthens the linkages between farms and urban areas can also improve the economics of farming.

- MITIGATION AND SUSTAINABILITY — Shifting to sustainable agricultural production and distribution can greatly contribute to greenhouse gas mitigation strategies, with spin-off benefits to other related environmental problems, like water usage, depleted soils, and run-off of chemicals. Reducing and then eliminating fossil fuels is central to the challenge in the short to medium term. A bigger challenge is in shifting farming practices to mitigate the non-fossil fuel emissions that are particular to agriculture.

- FOOD DEMOCRACY AND FAIRNESS — A new planning framework for food in BC can contribute to eliminating hunger and vastly improving nutrition. The concept of food democracy embraces the objective of ensuring access to a sufficient and nutritious diet for all, but based on dignity—not charity. In a market economy, the right to food means ensuring families have the income to afford the food they need, but systemic changes that better link housing, health and food policy can also improve outcomes for vulnerable populations.

Structural change is not a task that can be left to market (or supermarket) forces alone; it requires collective action.

9 BC Agriculture and Food Climate Action Initiative, *BC Agriculture Climate Change Action Plan*, a joint project of the BC Agriculture Council and the Investment Agriculture Foundation, August 2010. www.bcagclimateaction.ca/wp/wp-content/uploads/2009/08/BC-Agriculture-Climate-Change-Action-Plan1.pdf

10 Jeff Rubin, *Why Your World is About to Get a Whole Lot Smaller* (Toronto: Random House, 2009).

Properly planned, there is great potential in BC to create a food system that is just, resilient and sustainable. In the past, crises in the agricultural sector have led to new institutions, like supply management and wheat boards, that continue to support farmers to this day. New institutions that support sustainable agriculture and link local production to public and cooperative purchasing in urban areas can simultaneously increase farmers' incomes, reduce GHGs and contribute to better nutrition and reductions in hunger.

BC already has many of the ingredients in place. Unlike other provinces and the United States, BC has largely averted the worst aspects of industrialized food production. Much of BC's domestic food production occurs on small farms, and ties to local markets have been strengthening through initiatives like weekly farmers' markets, community shared agriculture projects, and home delivery services. BC has a tremendous asset in the Agricultural Land Reserve, although its erosion (particularly in fertile areas such as the Lower Mainland) in recent years is cause for concern. BC is also highly advanced in terms of awareness and activism around food. While this alternative food system currently represents a small share of the food consumed in the region, upon this foundation a just and equitable food system that supports a vibrant food economy and improves public health can be built.

PART 2

Adaptation and Self-Reliance

A 2007 ADAPTATION REPORT from the International Panel on Climate Change predicts that climate impacts will be uneven across the world, with falling agricultural output in some continents such as Africa, due to droughts and floods, whereas in North America there may be net gains in agricultural production, at least in the medium term.[11] Then again, extreme weather events such as hail storms, increased parasites and invasive species suggest production challenges difficult to glean from estimates of average impacts. And in the longer term, BC will have to contend with the impact of higher sea levels on prime agricultural land like the Fraser delta, and diminishing water supplies in the Interior.

The food we eat is deeply intertwined with a global marketplace dominated by large corporations in whose business we have little influence, save for the money in our collective wallets.

In truth, we do not know exactly how climate change will affect global (or local) food production over the next few decades. But we have good reason to be concerned, based on science and modeling of impacts, that a warming world will be one that systematically affects crop yields due to changes in precipitation patterns and higher temperatures, plus periodic extreme weather events, diseases and insect infestations that will hammer global supply chains.

About 60% of BC's food imports come from the US, and most of that from California. Drought is already a major factor in California, with water restrictions undermining agricultural production.[12] In the future, imports of fruits, vegetables and nuts are likely to decline and prices will rise, a development that should give us pause for thought. The food we eat is deeply intertwined with a global marketplace dominated by large corporations in whose business we have little influence, save for the money in our collective wallets.

11 Working Group II Contribution to the Intergovernmental Panel on Climate Change Fourth Assessment Report, *Climate Change 2007: Climate Change Impacts, Adaptation and Vulnerability*.

12 Ostry, *supra* note 2.

The only certainty is uncertainty about how such complex relationships among CO_2 concentrations, higher temperatures, extreme weather impacts, type of crop and soil will play out in the future. A top priority is for a BC food planning framework that enhances resilience and self-reliance, while reducing dependence on imports and large global agribusiness. The transition requires overcoming the inertia and influence of industrial-scale agriculture, and its overarching success in the form of abundant and cheap imported food. The sooner the BC government acknowledges and engages these fundamental challenges, the better off the province will be in the future.

AGRICULTURAL BASELINE FOR BC

BC's agricultural production tends to be composed of smaller farms that produce a wide variety of food for domestic consumption and export, with about 20,000 farms in total.[13] Food production in BC is diverse, and is generally related to differences in geography, land ownership, and climate and soil type across BC's regions, with small fruits and vegetables produced in the Fraser Valley, tree fruits in the Okanagan, dairy in the north Okanagan and Fraser Valley, beef ranching in the Interior, and grains and oilseeds in the northeast.[14]

BC's food self-reliance would drop to 34% if British Columbians shifted to the recommended healthy diet (higher consumption of dairy, fruit and vegetables, and lower consumption of meat and grains).

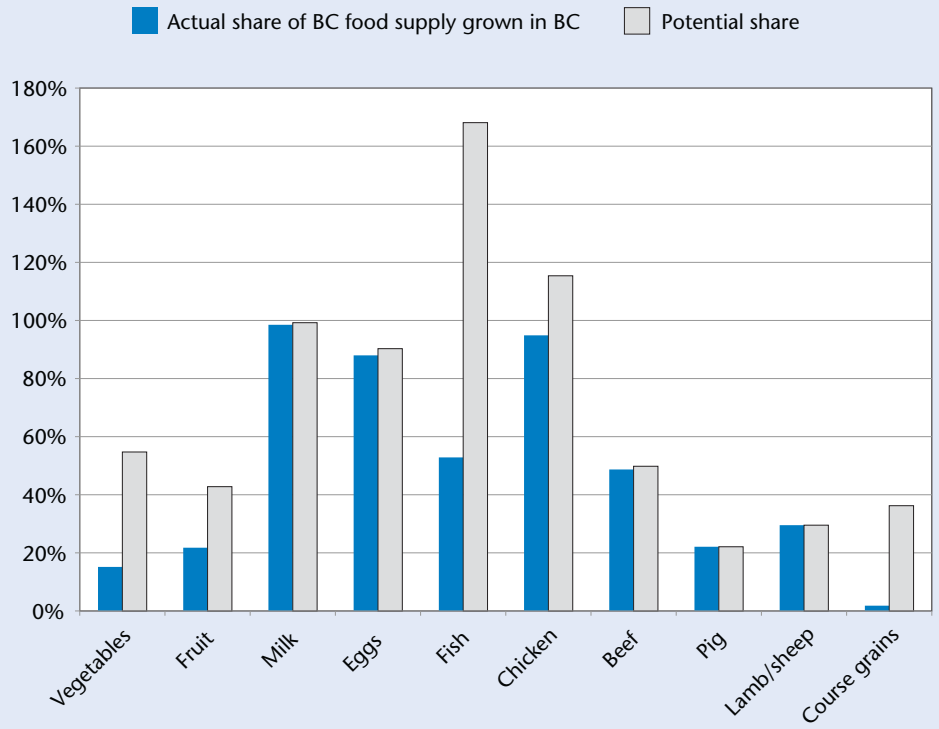
The BC Ministry of Agriculture and Lands has estimated (based on 2001 data) that about half (48 to 53%) of BC's food needs are met through BC production. This is consistent with past estimates, with essentially all of the growth in total production in recent decades matched by population growth. However, BC's food self-reliance would drop to 34% if British Columbians shifted to the recommended healthy diet (higher consumption of dairy, fruit and vegetables, and lower consumption of meat and grains) as set out in *Canada's Food Guide to Healthy Eating*.[15] A recent study found that the composition of BC's food production has moved in the opposite direction of the advice given by nutritionists, with "greater production of animal fats, and hay and grain for animal feed and much reduced production of traditional fruits, vegetables, and grains designed mainly for human consumption."[16]

A 2009 report from the Vancouver Food Policy Council (drawing on 2006 data) provides a detailed analysis of agricultural production in BC, including imports and exports (international and inter-provincial).[17] Figure 1 shows two measures for different food groups: the *share* of total food available to British Columbians that is produced in-province, and the *share potentially available* to British Columbians if there were no food exports from BC.

The share of BC food consumption that is grown in BC (dark bars) varies significantly across the major food categories, from 15% for vegetables to 99% for milk. Interestingly, BC is essentially self-sufficient in eggs, milk and poultry, the traditional supply-managed parts of

13 BC Ministry of Agriculture and Lands, *BC Ag Stats 2007*. Victoria.
14 BC Ministry of Agriculture and Lands, *supra* note 6, p. 13.
15 Ibid, 10.
16 A. Ostry and K. Morrison, "A Health and Nutritional Evaluation of Changes in Agriculture in the Past Quarter Century in British Columbia: Implications for Food Security," *International Journal of Environmental Research and Public Health* 7 (June 17, 2010): 2653–2665.
17 Serecon Management Consulting, "Food Secure Vancouver Baseline Report," prepared for the Vancouver Food Policy Council, March 2009, http://vancouver.ca/commsvcs/socialplanning/initiatives/foodpolicy/tools/pdf/FoodSecure_Baseline.pdf.

Figure 1: BC Food Production as a Share of Total Food Available



Source: Serecon Management Consulting, *Food Secure Vancouver Baseline Report*, March 2009

The dark bars of Figure 1 show the actual shares of BC's food supply that are produced within BC. The light bars show the potential shares if BC did not export any of its food production.

the agriculture system. In beef, BC exports relatively little but consumes via imports about double the amount it produces domestically.

Figures on fish are also startling. Although total production of fish is in excess of domestic demand, only half of the fish available to British Columbians is from BC. Numbers, however, are in flux: wild sockeye stocks appeared to have largely disappeared in key river systems in 2009, only to see a spectacular Fall 2010 return, the largest in many decades (and unlikely to be repeated). Budget cuts over the past two decades have contributed to a situation where federal and provincial governments are in the dark on the true state of wild fish stocks.

Corporate presence has strongly asserted itself in the rapid increase in farmed fish production, which is undermining wild stocks. Moreover, fish farming in Europe and North America "consists of feedlot operations in which carnivorous fish … are fattened on a diet rich in fish meal and oil."[18] This practice uses more fish flesh than it produces, significantly undermining the sustainability of small-fish fisheries (such as herring, sardines and mackerels), which are key food sources in many developing nations.

Figure 1 also shows the potential for self-reliance in BC (light bars), by looking at the amount of BC production as a share of the total food available (i.e. if there were no exports). British Columbians consume 15% of the vegetables grown in the province, but if all production was consumed domestically, the share would rise to almost 60%. Put another way, BC production could displace 45% of vegetable consumption that is currently imported. Based

18 D. Pauly et al., "Towards sustainability in world fisheries,) *Nature* 418 (August 8, 2009): 689–695.

on current production and consumption patterns, BC could achieve 50% self-sufficiency in fruits, vegetables and beef. In other meat areas—pigs, goats and sheep—BC is far from self-sufficient. In these areas, a self-reliant BC would need to vastly increase production to meet existing consumption and/or reduce consumption levels.

Development of supportive infrastructure would be required to increase local food shares. For example, much food production is seasonal and greater self-reliance would require investments in cold storage, canning and freezing capacity. Additional resources to support local food processing (for example, through food hubs or precincts) are also needed.

Another opportunity is to reduce waste in the food system—about half of food production is "lost" at some point. Many factors are at play in such a high percentage of waste, including a combination of food going bad both in storage and in transport, discards due to less-than-perfect appearance, restaurant leftovers gone to waste, refrigeration systems failing, pest infestations and/or outbreaks, and local barter. There is a vast difference between salvage-able and sell-able food, so caution must be applied in interpreting this result; nonetheless, greater efficiencies in food distribution networks are an obvious source of enhanced local food availability.

Much food production in BC is seasonal and greater self-reliance would require investments in cold storage, canning and freezing capacity.

A food planning framework must include targets and timelines related to BC production for the domestic market to be effective. If BC could shift just 1.5% of its overall consumption per year to local sources, the province would supply 80% of its food needs by 2030. This must be balanced against the benefits of inter-provincial and international trade in providing a variety of foods and a diversified food supply, and in the case of a domestic disruption (such as a major flood in the Fraser Valley, an event that nearly happened in Spring 2007). Planning should also consider emergency buffer stocks of food in the event of major disturbances.

A final consideration for local food supply is that BC's population is forecast to rise from 4.4 million to more than 6 million by 2036. This number could be even higher in the event of an influx of migrants from other countries who themselves are adversely affected by climate change. This simple math suggests that greater self-reliance plus a growing population will require, at a minimum, a doubling of food production within 20 years.

SUPPORT FARMERS, REDUCE CORPORATE CONTROL OF THE FOOD CHAIN

With so much at stake, a key challenge is an agricultural sector that performs poorly in delivering decent incomes to farmers, in particular the smaller, family-run farms that make up more than 90% of the province's farms. More than half of BC farms (57%) have sales less than $100,000 per year, making most of them too small to be economically viable without off-farm income to support household and operators' living expenses. Larger farms (revenues of $250,000 or more) make up one-quarter of the total but four-fifths of sales and 95% of net operating profits.[19] Average farm receipts in BC in 2008 were $311,439, but after expenses net farm income averaged only $25,342, with off-farm income almost three times as large.[20]

19 D. Sparling, *British Columbia Farm Income and Farm Structure, 1999-2004* (Guelph: Institute of Agri-Food Policy Innovation, November 2006).

20 *British Columbia: Average Farm Income From All Sources (2007-2008)*, http://www4.agr.gc.ca/resources/prod/doc/pol/pub/for-08-prev/pdf/bc_e_08.pdf.

Farmers are the only part of the BC food system that do not have a high degree of corporate control. In contrast, major farm inputs—such as fuel, fertilizer and seeds—are tightly controlled by a handful of companies, leading to rising costs for farmers.[21] Market power in food distribution means farmers are squeezed in terms of getting a decent price for the food they produce, often only a small fraction of the retail sales price. Many of BC's formerly grower-owned cooperatives that used to handle packaging and processing for member farms have gone out of business or been transformed into private companies that aim to serve shareholders, not farmers. Regulations established for industrial food producers are also affecting small operators. An example is the change to abattoir laws, based on the need for disease prevention in large-scale operations, which has been detrimental to small-scale meat processing.

In addition, wages and working conditions for farmworkers should be improved. An increasing number of farm workers in recent years have come into the province as temporary migrants, leading to the bizarre outcome that the aspirational 100-mile diet could be made possible by importing workers from as far as 3,000 miles away. The number of migrant workers in BC, for example, increased from 98 in 2004 to 3,117 in 2008.[22] These workers have no recourse to employment standards provisions (agriculture is excluded from BC's Employment Standards Act), and do not have the basic rights of citizens, leaving them vulnerable to exploitation and poor working conditions. Improving wages and working conditions for these workers (and giving them a real path towards citizenship) must be part of a new deal for farms.

Public or cooperative institutions in support of domestic production can improve incomes for farmers and workers as well as matching supply and demand. This is clearly the case in the supply-managed areas of BC agriculture (dairy, eggs and poultry), a model that could be implemented for fruits and vegetables, meat and other products.

History has demonstrated that public or cooperative institutions in support of domestic production can improve incomes for farmers and workers as well as matching supply and demand. Although not without its problems, this is clearly the case in the supply-managed areas of BC agriculture (dairy, eggs and poultry), a model that could be implemented for fruits and vegetables, meat and other products. Such institutional reforms would require substantial support from farmers themselves, and could run afoul of international trade rules. Protected by high tariffs, existing supply management arrangements have been under threat in international trade negotiations, as the US and other countries seek their elimination. Federal and provincial governments need to maintain this framework of support for supply management, and seek to carve out new spaces in trade rules for food security.

Examples of cooperative approaches come from BC's Interior and North, though the model has met with mixed success in the absence of supportive government policy. The Northwest Premium Meat Co-op, near Smithers, was developed as a cooperative abattoir for small-scale meat producers in and around the Bulkley Valley, in the face of more restrictive meat processing regulations introduced by the province in September 2007.[23] Unfavourable market conditions led to the co-op being shut down in May 2010, but the model has re-emerged in 100 Mile House, which saw the successful incorporation of the South Cariboo Meat Cooperative.[24] Any new models will face challenges, but clearly local meat producers feel

21 G. Stanley, *From the Farm to the Table: The Transformation of North American Food Processing and Implications for the Environment,* report for the Council on Environmental Cooperation, Environment, Economy and Trade Program (2004).

22 Fairey et al., *Cultivating Farmworker Rights: Ending the Exploitation of Immigrant and Migrant Farmworkers in BC,* (Vancouver: Canadian Centre for Policy Alternatives, 2008). Updated 2008 stat via personal communication with David Fairey.

23 T. Kapelari, "Open for business—but not for profit," *Northword Magazine* (Smithers, BC), 2008.

24 Carole Rooney, "Meat Co-op meets regs head on," *100 Mile House Free Press News*, February 9, 2010.

that a cooperative model fits their needs, in light of recent meat regulations. If successful, cooperative approaches could be better utilized to circumvent market power in distribution networks, increasing incomes for farmers, particularly if the emphasis is supplying to local markets.

A more localized food system will need to be accompanied by a more coherent public framework of insurance against potential climate impacts. The likelihood of flooding, drought, fires, insect infestations, pollinator disruptions, extreme weather events or even "bad years" in terms of growing conditions will all increase as temperatures rise due to climate change. A coordinated supply management approach can balance output from the overall sector, combined with measures that provide income security against adverse events beyond our control.

Agriculture could thus be the domain of substantial new "green jobs" if a career in farming can be made more attractive financially.

Clearly, a better deal is needed for farmers if BC is to have a resilient and self-reliant food system. Agriculture could thus be the domain of substantial new "green jobs" if a career in farming can be made more attractive financially. Whether this means higher prices for consumers is not entirely clear—if corporate middlemen can be reduced or eliminated through cooperatives and other institutions, farmers could capture a greater share without consumer prices necessarily going up.

The historical supports received by farmers have no equivalent in fisheries. A new sustainable approach to the harvesting of seafood that also supports workers and communities needs to be developed. In addition to creating significant marine reserves to help restore some lost stocks and ecosystems,[25] a return to small-scale fisheries (through the elimination of numerous barriers, including subsidies to industrial fisheries) could provide a variety of benefits, including job creation, reduced fossil fuel consumption and less pressure on increasingly threatened fish stocks.[26] New models for small-scale fisheries need to be developed, but could include the fishing equivalent of Community Shared Agriculture initiatives by linking local fishers to urban consumers (the first of these started at Fisherman's Wharf in Vancouver in 2009). Reinvestments in civil service capacity will also be needed to develop and manage a sustainable fishery.

PROTECT AND EXPAND THE AGRICULTURE LAND RESERVE

More farmland will be required to feed a growing population. BC's Ministry of Agriculture and Lands estimates that just over half a hectare of land is needed to feed one person a healthy diet (dairy, meat, fruits, vegetables and grains). This translates into 2.78 million hectares of food-producing land (about one-tenth of which must be irrigated) that will be needed by 2025.[27] In 2006, total farmland in BC was slightly larger, 2.84 million hectares; the total area of Agricultural Land Reserve was 4.62 million hectares.[28]

Land for food, however, must increasingly compete with other potential uses, including sprawl, conservation, wood products, biofuel production, and flooding to generate hydro-

25 Pauly et al., *supra* note 17.
26 Jennifer Jacquet Daniel Pauly, "Funding Priorities: Big Barriers to Small-Scale Fisheries, *Conservation Biology* 22(4) (2008): 832–835.
27 BC Ministry of Agriculture and Lands, *supra* note 5, p. 12.
28 BC Ministry of Agriculture and Lands, *Ag Stats 2007*.

electricity. Protecting the best farmland, along with a better understanding of water resources as they relate to food and agriculture, should be a priority in a food planning framework. The status quo for water resources is tremendously wasteful, based on an assumption of limitless water, at a time when water quality and water shortages are arising as key issues in parts of BC.

This underlines the importance of the Agricultural Land Reserve (ALR), an institution and distinction of BC's agriculture sector, and an asset unlike any other in North America. A major concern at present is from applications to remove land from the ALR, particularly land on the urban fringe converted into unsustainable suburban housing developments and transportation corridors. Removing productive farmland to build highways, pipelines and new sprawling suburbs may be the single worst thing the provincial government could allow. Bolstering the ALR would thus serve a double purpose as urban containment, facilitating the transition to "smart growth" or more sustainable and compact communities in urban centres. The recent appointment of a new head of the Agricultural Land Commission and a commitment to public consultation are positive signs of an end to the recently increasing removals of land from the reserve.

Protecting the best farmland, along with a better understanding of water resources as they relate to food and agriculture, should be a priority in a food planning framework.

Expanding the productivity of land is also of interest. Greenhouse operations have increased in profile in recent decades, and with an estimated 28 times the yield of field production per hectare,[29] they offer the prospect of enhanced and year-round food supply. Almost all greenhouse operations in BC are in the Lower Mainland, yet are currently being considered for regions with unfavourable growing conditions such as Whistler. The sector has been growing rapidly in sales with three-quarters of production exported to the US.[30] Greenhouses must, however, shift away from fossil-fuel energy in favour of more sustainable sources.

Beyond farms, the development of an enlightened food culture includes a wide range of urban agricultural opportunities, which start in the backyard but can include community and rooftop gardens. The conversion of lawns or asphalt to food is about as local as one can get. An interesting development is the formation of an urban community shared agriculture project in Vancouver, echoing the "victory gardens" concept during World War II. These projects may yield only a small share of the total food supply, but are perhaps more important in the reconnection of the food we eat to land and soil.

CONNECT LOCAL FARMERS TO URBAN INSTITUTIONAL BUYERS

In food distribution, a handful of supermarket chains dominate the BC market, although Vancouver is also served by an abundance of family-owned produce stores. Alternative supply networks have grown rapidly in recent years (including farmers' markets, community shared agriculture, and home delivery services) but are still rather small in the grand scheme of things. For example, in 2006 consumers spent about $65 million at BC farmers' markets,[31] compared to more than $1 billion in GDP from crop and animal production that year.

29 Serecon, *supra* note 16.

30 BC Ministry of Agriculture, Food and Fisheries, *An Overview of the BC Greenhouse Vegetable Industry* (2003).

31 D. Connell, *Economic and Community Impacts of Farmers' Markets in BC*, report for the BC Association of Farmers' Markets (2006).

A CLOSER LOOK AT PROGRAMS OUTSIDE BC

Linking Farms and Hospitals, North Carolina

North Carolina has been taking significant steps to integrate locally supplied food to its public institutions. A "Farm to Hospital" program through the Appalachian Sustainable Agriculture Project (ASAP) works with hospitals to allow them to support local farms and connect patients and staff with healthy, nutritious cafeteria food to be enjoyed by patients and staff alike. The system's core values are centred around encouraging patients to learn where their food comes from, and how to prepare it.

In the Farm to Hospital program, hospitals are provided with local food guides by ASAP, which inform which foods are available when, from whom. Within the hospital food choices, locally-grown foods are identified on their menu with the "Appalachian Grown" logo. In-house hospital promotional materials created by ASAP tell eaters about farmers growing and providing them with their food, personalizing their meal choices. The program also distributes Market Bucks, coupons that can redeemed at Asheville City Market-South for fresh, local products by visitors and former patients from the hospital, encouraing the continuation of local food eating trends.

Community farm-to-institution matchmaking models have worked to supply a single product (e.g. potatoes) to smaller institutions that might not otherwise be able to create a sufficient demand for local foods from local farmers. A public "matchmaker" can help local farmers and institutions who might not otherwise find each other to form customized local food options specific to each others' needs, closing gaps between supply and demand of local food from growers to institutional eaters.

Schools have huge potential to source food for meal programs from local sources, but also to grow food on school land. Expanding programs could have a payoff in terms of nutritious meals for students but also engaging children in how to grow food, and in understanding the components of a healthy diet.

A key strategy to expand local production for domestic markets is leverage the purchasing power of large public and non-profit institutions in urban areas. This could include schools, hospitals, universities, prisons, and non-profit and social housing units. If coordinated, public, cooperative and non-profit purchasers of food can all contribute to the growth of local and sustainable food systems while meeting other social and economic objectives. If all existing food budgets in the public sector were dedicated to local food sources, the multi-million dollar impact would be transformational in creating a more localized food system.

Schools have huge potential to source food for meal programs from local sources, but also to grow food on school land. Expanding those school meal programs with additional funding could have a payoff in terms of nutritious meals for students but also engaging children in how to grow food, and in understanding the components of a healthy diet. Additionally, in schools of lower economic brackets, more broad-based meal programs level the playing field in terms of access to nutritious food (which should also improve learning outcomes). Universities and schools thus have the opportunity to play a key position in developing an educated culture of citizens familiar with the principles of sustainable food systems, but at a minimum should serve students nutritious and local food.

Hospitals and other care institutions can better integrate healthy, local food as part of health care itself (not to mention that better food will improve public health). Hospitals can also influence communities in terms of their eating habits, encouraging consumption of local

foods across all age demographics, from pregnant mothers, to children, to the elderly.[32] Malnourished populations who might otherwise lack access to healthy food can have fresh, locally-grown fruits and vegetables while they are in a position to rest, heal and reflect.[33] This would serve as a major reversal of BC's current model, which contracts out food services to multinational companies that deliver poor-quality meals to patients. We consider some analogous moves for social housing in Section 4.

Such urban-institutional-meets-local-agricultural systems need to be grown over time, building on the experience of small-scale pilots and initiatives, and existing Community Shared Agriculture relationships and buyers' cooperatives. Each farm, distributor and institution is unique in terms of size, capacity and willingness to participate in local food systems. Many opportunities surrounding the development of linkages between local food suppliers, distributors and institutions will require collaborative efforts by and between farmers, distributors, institutions, marketing entities and consumers alike to guarantee an adequate, affordable, available supply of fresh local foods on a consistent basis.[34]

Many opportunities surrounding the development of linkages between local food suppliers, distributors and institutions will require collaborative or collective efforts by and between farmers, distributors, institutions, marketing entities and consumers alike.

Another dimension to developing these relationships includes cultural food needs. For BC's immigrant population, the cultural imperative reflects a desire to maintain the flow of produce and products from overseas. There are clearly opportunities to augment and further develop relationships with local farmers to grow foods for which there is a particular cultural demand. To the extent that local sources can displace imports, this would benefit the development of a local food economy.

32 Molly Nicholie, Growing Minds Program Coordinator, Appalachian Sustainable Agriculture Project, conversation via telephone, October 2, 2009.

33 V. Zajfen, "Fresh Food Distribution Models for the Greater Los Angeles Region" (2008), http://departments.oxy.edu/uepi/publications/TCE_Final_Report.pdf.

34 ASAP communications (2009).

PART 3

Mitigation and Sustainability

GHG emissions are one symptom of a larger context of unsustainable agriculture that includes conversion of forests to cropland or pasture, run-off of nitrogen and phosphorus from chemical fertilizers, and depletion of water resources.

IN THE PREVIOUS SECTION, we argued for a greater local orientation of BC's food system as a response to climate change. Next we turn to BC's food system as a contributor to climate change—the greenhouse gas (GHG) emissions associated with food production in BC, and through our imports of food from other jurisdictions. GHG emissions include carbon dioxide from the combustion of fossil fuels, similar to other parts of the economy, but also from methane and nitrous oxide emissions that are specific to agricultural practices.

GHG emissions are one symptom of a larger context of unsustainable agriculture that includes conversion of forests to cropland or pasture, run-off of nitrogen and phosphorus from chemical fertilizers, and depletion of water resources. A true picture of sustainability should take these broader factors into consideration, although in this section we focus on reducing emissions.

Globally, efforts to quantify the emissions associated with agriculture and food show them to comprise a large share of worldwide emissions. According to the World Resources Institute, agriculture is responsible for 5.7 billion tonnes of carbon dioxide per year, or 17% of the world's total greenhouse gas inventory (excluding land use changes, such as the conversion of forests to farmland, a process that releases GHGs).[35] A report from Greenpeace International estimated GHGs from agriculture at between 17% and 32% of global emissions, when land use changes are included.[36]

According to the BC Greenhouse Gas Inventory, agriculture in BC was responsible for 2.3 million tonnes of CO_2 equivalent, or only 3.6% of BC's greenhouse gas emissions in 2007. However, this number counts only *direct agricultural emissions* associated with animal digestion and manure, and emissions from fertilizers used on crops.

35 World Resources Institute, Climate Analysis Indicator Tool (2000).

36 Jessica Bellarby, Bente Foereid, Astley Hastings and Pete Smith, *Cool Farming: Climate impacts of agriculture and mitigation potential* (Netherlands: Greenpeace International, 2008).

Table 1: BC Agricultural GHG Emissions, 2007

BC production	GHG emissions ($kt\text{-}CO_2e$)	Percent
Livestock emissions	1,517	37.1%
Fertilizers/land use	826	20.2%
Energy use on farms	855	20.9%
Production and transport of agricultural chemicals	824	20.1%
Net imports of animal feed	69	1.7%
Total estimate	4,091	100.0%

Source: Ministry of Environment, BC Greenhouse Gas Inventory; Authors' calculations based on Statistics Canada data on energy use, agricultural chemicals, and animal feed.

Table 1 shows that GHG emissions from agricultural production in BC are, in fact, almost double this amount if we include energy use on farms (tractors and other farm machinery), the production of agricultural inputs such as fertilizers and pesticides, and imports of animal feed. Table 1 does not count emissions from manufacturing and processing of food and beverages, nor does it account for fisheries emissions, transportation of food to BC and within the province, or emissions associated with food waste at various points in the system. A comprehensive analysis would also include emissions associated with energy used in retail establishments, and cooking in BC homes and restaurants. Finally, because BC imports more food than it exports, BC's "food-print" is larger on a consumption basis, from additional production and transportation emissions related to food imported from other provinces and other countries.

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Statistics Canada estimates for GHG emissions associated with food consumption by Canadians point to higher emissions when imported food is considered. While this analysis

Table 2: GHGs Associated with BC Food Consumption, 2003

	GHG emissions (kt CO2e)	Share of total
Beef	937	15.5%
Pork	129	2.1%
Poultry	322	5.3%
Cheese	465	7.7%
Eggs	77	1.3%
Fluid milk	341	5.6%
Fish	148	2.5%
Grain products	545	9.0%
Prepared foods	1,271	21.0%
Beverages	363	6.0%
Condiments	242	4.0%
Other	1,212	20.0%
Total	6,053	100.0%

Note: BC emissions are estimated based on population share.
Source: Statistics Canada, Human Activity and the Environment: Annual Statistics, 2009; BC Stats, "Food for Thought: How Green is our Diet?," *Environmental Statistics*, November 2009.

is an underestimate of emissions from consumption (data are only available for 2003, and do not include full lifecycle emissions associated with crop and livestock production abroad) it is indicative of the emissions attributable to broad categories of food. Nonetheless, emissions from a consumption perspective are roughly 50% higher on this basis than production emissions estimated in Table 1.

PHASING OUT FOSSIL FUELS

Because the official statistics make agriculture look like a very small contributor to climate change, emission reductions have not been a priority. But clearly, agriculture must be included in economy-wide strategies to reduce and eventually eliminate fossil fuels. This will entail some form of carbon pricing, standards and regulations within our food system, related to a broader shift away from fossil fuels to an energy system powered by clean sources. The key energy sources for agriculture include electrification, and limited and local use of biofuels, particularly as they relate to some farm organic wastes (as opposed to converting farm land to growing crops to be used as biofuels elsewhere, which would not be a positive direction for BC).

Agriculture must be included in economy-wide strategies to reduce and eventually eliminate fossil fuels.

The single largest source of BC's agricultural emissions is fossil fuel combustion for on-farm machinery and equipment. New electric options for passenger vehicles are at hand, but low-emission trucks and tractors that are robust in a farming application will be needed as technology improves (the contenders are likely to be electric, biofuel or hydrogen fuel cell, though at this point in time, much is speculative). The transition can happen smoothly if we allow for turnover of capital stock (the regular wear and tear of machinery and equipment means they must eventually must be replaced). As long as standards are established that move toward greater fuel efficiency and zero-emission vehicles, this is an opportunity to upgrade to equipment with steadily less emissions intensity without adding additional burdens to a sector that is already stretched in terms of resources.

Reductions in fossil fuel emissions are also available from breaking down the industrial food chain, which avails itself of cheap fossil fuels to transport fertilizers to fields, and feed to farms, then to processing and finally to market. It is doubtful that this extensive chain, while impressive in its economies of scale, can survive in a world of post-peak conventional oil supplies and much higher energy prices.

Emissions from transportation are related to technology, but also distance travelled and mode of transportation. Transportation is a small but not insignificant piece of agriculture's food-print, about 11–12% of total emissions from food, according to studies in the US and UK.[37] The more local food sources are, the lower will be emissions—although the mode of transport also matters (shipping and rail being relatively low in emissions intensity, followed by trucking, with airplane the highest). Hyper-efficient distribution networks may mean that emissions are lower for some food imported at great distance than smaller amounts of local

37 C. Webers and H. Matthews, "Food-Miles and the Relative Climate Impacts of Food Choices in the United States," (Pittsburgh: Department of Civil and Environmental Engineering and Department of Engineering and Public Policy, Carnegie Mellon University, 2008), http://pubs.acs.org/doi/abs/10.1021/es702969f; T. Garnett "Food and Climate Change, the World on a Plate" (2008) www.navigateconferences.com/downloads/CooLogistics%20-%20Tara%20Garnett.pdf.

food trucked in from a single farm. More robust distribution and transportation networks will also improve efficiency of transporting goods from the smaller farms to urban areas. Rail options for local food transportation should also be considered. On the other hand, food shipped by airplane should be eliminated entirely as this is the most emissions-intensive mode of transportation.

SUSTAINABLE AGRICULTURE PRACTICES

Achieving major reductions in non-fossil-fuel emissions, such as methane emissions from animals and emissions from the use of synthetic fertilizers, requires a shift away from industrial practices. Because soils and plants can remove carbon dioxide from the atmosphere, policies must enhance the role of BC agricultural lands as carbon "sinks." This includes greater growth of perennial plants and a transition to practices that build up the soil (and thus, carbon storage) over time.

Organic practices have great potential to mitigate the GHGs associated with food production. A study for the UN's Food and Agriculture Organization found that organic practices contribute to reductions in GHG emissions, have a greater potential to sequester carbon in biomass, and create more employment opportunities than conventional agriculture. This is because organic systems forgo the heavy reliance on energy intensive fertilizers, chemicals and concentrated feed of conventional agriculture, while also using less irrigation, heavy machinery and heated greenhouses.[38]

No-till farming, greater use of cover crops, agroforestry techniques and more harmonious design practices (generally known as "permaculture") have all been suggested as options to reduce emissions, but overall much more research on farm management practices to reduce GHG emissions is required.

BC organic production is a fast-growing sector, comprising about 15% of fruit and vegetable production, and 1% of meat and dairy. On the consumption side, BC sales of certified organic food topped $1 billion in 2006, and BC accounts for 26% of certified organic sales in Canada compared to 13% of the national population.[39]

For crop production, the production and application of synthetic fertilizers and pesticides generates substantial GHG emissions. These can be mitigated though switching to organic and mineral fertilizers, although these still have transportation emissions associated with them. Chemical or synthetic inputs for crop production can be replaced by animal manure, a traditional fertilizer that has become a source of waste in separated livestock operations. As the Institute for Agriculture and Trade Policy notes: "Integrating animal husbandry with crop production on the same farm and at an appropriate scale can reduce or even eliminate the need for synthetic fertilizers."[40] In addition, encouraging those farms to transition from large applications of fertilizers to more precise nutrient management techniques specific to crop types is an effective way to reduce emissions from agricultural chemicals.

38 J. Ziesemer, *Energy Use in Organic Food Systems* (Rome: Natural Resources Management and Environment Department, Food and Agriculture Organization of the United Nations, August 2007).

39 A. Macey, *Retail Sales of Certified Organic Products in Canada, 2006* (Organic Agriculture Centre of Canada, May 2007).

40 J. Edwards, J. Kleinschmidt and H. Schoonover, *Identifying our Climate "Foodprint": Assessing and Reducing the Global Warming Impacts of Food and Agriculture in the US* (Minneapolis: Institute for Agriculture and Trade Policy, 2009).

A number of alternative practices such as no-till farming,[41] greater use of cover crops, agroforestry techniques and more harmonious design practices (generally known as "permaculture") have all been suggested as options to reduce emissions, but overall much more research on farm management practices to reduce GHG emissions is required. A discussion paper for the Organic Agriculture Centre of Canada reviews a wide range of strategies for organic approaches to reduce GHG emissions and improve energy efficiency.[42]

Livestock emissions are also a major part of GHG emissions associated with food. Cattle, in particular, produce large amounts of methane in their digestive processes (true of other "ruminants" like sheep and goats, as well, but those populations are very small compared to cattle). Emissions from cattle, sheep and goats can be reduced by returning to a grass-based diet—for which their digestive systems are designed. This means grazing on pastures, which then use manure to replenish the soil. While grass-fed is already the norm for most BC cattle, these animals are often transported to Alberta for fattening on feedlots, then returned to BC.

One US study estimated that if all food was localized, the reduction in emissions would be roughly equivalent to households shifting their diet one day per week from red meat and dairy to a vegetable-based diet.

A truly zero emission food system will ultimately require reductions in consumption of meat in general, and beef in particular. The North American diet is very meat heavy (especially in red meat) and in general would benefit from a reduction in the consumption and production of meat. That said, from a nutrient management standpoint, grazing cows for beef could reduce food system emissions if their manure is managed properly. Reducing the demand for meat would allow for pastured animals, eating what nature designed for them to eat and returning to the land the untainted fertilizer the land requires.

Life cycle studies stress that even small changes in diet may be more important than long-distance transportation considerations when it comes to reducing GHGs from the food system. One US study estimated that if all food was localized, the reduction in emissions would be roughly equivalent to households shifting their diet one day per week from red meat and dairy to a vegetable-based diet.[43] Marketing campaigns geared towards low-carbon diets and carbon conscious consumers could help this transformation.

41 Without pesticides like Round-up, as "no-till" has been used to justify such practices.

42 R. MacRae, "Comparing energy use and GHG mitigation potentials in organic vs. conventional farming systems," discussion paper (Truro, NS: Organic Agriculture Centre of Canada, March 31, 2009).

43 Weber and Matthews, 2008, *supra* note 36.

PART 4

Food Democracy and Fairness

UK PROFESSOR OF FOOD POLICY Tim Lang coined the term "food democracy" in the mid-1990s in reference to the struggle for improvements "to ensure that all have access to affordable, decent, health-enhancing food." This concept challenges corporate structure and control of food, and goes beyond the adequacy of food supply, to stress "decency and social justice in the food system's wages, working conditions and internal equity."[44]

As much as food prices have come down, poverty has gone up, and is the driving force behind food insecurity.

Existing inequalities in society are likely to be exacerbated by climate change and by climate policies, if those inequalities are not actively considered in policy design. Ideally, broad-based policies that reduce systemic inequality through the labour market or income transfers would reduce the need for targeted subsidies, credits and programs for low-income households. An over-arching concern in a shift towards a more sustainable and resilient food system is the potential impact on the cost of food. In 2010, food prices relative to income are essentially at all-time lows, the product of an industrialized food system that benefits from tremendous economies of scale, but mainly because that system externalizes many of its costs onto the environment, workers and consumers. As much as food prices have come down, poverty has gone up, and is the driving force behind food insecurity.

Consumers seeing higher prices for local, organic produce would be correct to wonder whether they can afford the food system we describe above. In 2007/08, about 8% of households in BC experienced food insecurity at some point in the year, and about one-third of these were considered "severe."[45] Based on estimates from the Dieticians of Canada on the cost of a nutritious food basket, a family of four with one earner at the median income would

44 T. Lang, "Food Security or Food Democracy? Rachel Carson Memorial Lecture," *Pesticides News* 78 (December 2007).

45 Statistics Canada, *Household food insecurity, 2007–2008*, Canadian Community Health Survey, cat#82-625. www.statcan.gc.ca/pub/82-625-x/2010001/article/11162-eng.htm.

pay 19% of that income for food, but this rises to 34% if that earner is in a low-wage job, and 49% if on social assistance. They conclude that "low income British Columbians cannot afford healthy food."[46]

Consumers may also be in danger from the corporate control Lang criticizes—the spike in food prices in 2007 and 2008 was attributed in large part to global trading corporations like Cargill hoarding supplies to drive up prices before releasing them for a higher profit.[47] What is clear is that higher food prices would further widen inequalities in society, and would exacerbate food insecurity in a system already characterized by hunger. Poor nutrition is hunger's companion, as the lowest quality foods in nutritional terms tend to be the cheapest. People get calories but not essential nutrients, with commensurate impacts on their health and costs to the health care system.

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The body of evidence illustrating the clear link between income and food security has grown significantly in recent years. Even during the recent economic boom, food insecurity remained a prevalent problem in Canadian households. In 2008, 700,000 Canadians used a food bank, and approximately three-quarters of food bank users had household incomes under $15,000. Respondents also spent over 60% of their current income on rent and utilities. Furthermore, the authors note that "the prolonged economic boom simply by-passed a substantial number of the least well-off in our society."[48]

The 2008 surge in global prices for basic staples revealed potential vulnerabilities down the road, particularly for families who are already challenged to put sufficient and nutritious food on the table. As recognized in the 2006 Provincial Health Officer's Report, "the main solution to individual and household food insecurity is to eliminate poverty."[49] Food insecurity, in addition to health consequences, can also have a negative effect on psychological and educational outcomes for children and social functioning in adults.

In the absence of a broad restructuring of the food system, community-based food initiatives—including food banks and a range of other institutional and community resources—represent the front line in Canadian responses to food insecurity.[50] In BC these include regional health authorities, municipal food policy councils, local governments and grassroots organizations. These organizations cannot directly address income security issues that underlie food insecurity in BC, but can work with communities to develop programs that promote affordable, nutritious meals that simultaneously contribute to a more sustainable food system.

A different aspect of food democracy relates to the different traditional diets of the wide range of cultural groups in BC, from First Nations to recent immigrants. Coastal First Nations in BC have a traditional diet based on salmon, and in spite of a banner 2010 run, the longer-term viability of sockeye stocks is great cause for concern. From the perspective of food security,

46 Dieticians of Canada. *The Cost of Eating in BC 2009: Low income British Columbians can't afford healthy food*. www.dietitians.ca/pdf/CostofEating2009.pdf.

47 P. Rosset, "Food Sovereignty in Latin America: Confronting the New Crisis," *NACLA Report on the Americas* (May/June 2009).

48 M. Goldberg and D. Green, *Understanding the Link Between Welfare Policy and the Use of Food Banks* (Ottawa: Canadian Centre for Policy Alternatives, 2009).

49 BC Ministry of Health, Office of the Provincial Health Officer, *Food, Health and Well-Being in British Columbia*, Provincial Health Officer's Annual Report (2006).

50 S. Kirkpatrick and V. Tarasuk, "Food Insecurity and Participation in Community Food Programs among Low-income Toronto Families," *Canadian Journal of Public Health* 100(2) (2009): 135–39.

the non-market harvest of salmon is an essential staple that cannot be easily replaced. At a deeper level, salmon are iconic in First Nations culture and disruption of supplies is deeply troubling.

IMPROVING ACCESS TO FOOD

The income dimension of food security demonstrates the complexity of addressing systemic failures of the food system, whether they are related to sustainability or social justice. Because adequate access to healthy food is deeply linked to its cost, any price increases in food will result in greater food insecurity and/or increased malnutrition for vulnerable populations, both in Canada and abroad. Addressing income security is therefore a key component of meaningfully addressing food security in BC.

The concept of a living wage is important in this regard. Individuals and families need to be able to earn enough income from work to cover the necessities of life. A living wage works out to $18.17 per hour in Vancouver for a typical family of four.[51] A nutritious diet would cost that typical family $756 per month, as estimated by the Dieticians of Canada.[52] The inescapable conclusion is that low-income households cannot afford a healthy diet. If the minimum wage *was* a living wage, incomes would automatically rise to offset food price increases arising from greater self-reliance and reducing food-related GHGs.

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Adequate income is part of a successful anti-poverty plan in other regards.[53] Income support for the non-employed is already inadequate, and benefit rates are arbitrary rather than linked to the costs of basic goods and services. Income support levels must be dramatically increased, and anchored to the actual cost of living, then indexed so that benefit rates are adjusted to take into consideration any increases in the cost of food. Instead of means-testing programs for income as a last resort, a more broad-based approach than current provincial income assistance regimes would include the concept of a basic or guaranteed income, structured like other income supports for children and seniors, such that benefits phase out slowly as income rises and most families receive a benefit (if not necessarily the maximum amount).

Along with adequate incomes, a range of other complementary policies would help address income pressures, in turn strengthening food security in BC's low-income households. These include the development of affordable housing, publicly-provided child care, and expansion of other public services.[54] The key point is that the prevailing income distribution suggests large vulnerabilties in the transition to a sustainable food system and these must be addressed comprehensively

51 Tim Richards, Marcy Cohen and Seth Klein, *Working for a Living Wage 2010: Making Paid Work Meet Basic Family Needs in Vancouver* (Vancouver: CCPA–BC Office, 2010), www.policyalternatives.ca/livingwage2010.

52 Dietitians of Canada, *The Cost of Eating in BC 2009: Low-income British Columbians can't afford healthy food* (2009).

53 Seth Klein et al., *A Poverty Reduction Plan for BC* (Vancouver: CCPA–BC, 2008), www.policyalternatives.ca/publications/reports/poverty-reduction-plan-bc.

54 S. Kerstetter and M. Goldberg, *A Review of Policy Options for Increasing Food Security and Income Security in British Columbia—A Discussion Paper,* (Provincial Health Services Authority of BC, 2007).

LINKING FOOD, HOUSING AND HEALTH POLICIES

The most marginalized populations in BC suffer from insecurities in food as well as housing, both of which are linked to physical and mental health. Historically, policy approaches to each of food, housing and health have occurred in silos, and been characterized by policy failures. That appears to be changing through initiatives such as the Joined-Up Food Security and Social Housing Policy, which includes Vancouver Coastal Health, BC Housing and the City of Vancouver's Social Planning Department, with participation of non-profit service providers and advocates.

The development of an integrated and systemic approach to food, housing and public health is still in early days. This approach recognizes the need to incorporate food security into social housing policy, in terms of planning and programs. Barriers to food security for marginalized populations, in addition to income, include the absence of nearby grocery stores, travel costs associated with accessing distant grocery stores, availability of food preparation and storage on-site, and the presence of nutritious food programming for people with disabilities, mental health issues and addictions.[55]

Food policy for marginalized populations must be sensitive to the needs and capabilities of particular individuals. A report for Vancouver Coastal Health on food security and housing in the Downtown Eastside recommends that food security plans be developed for all social housing units and that food be made available with no barriers. It notes that support for a range of options is needed, including on-site food provision in cafeterias, food delivery programs, community kitchens and in-room cooking facilities.[56] Providing options so that people can have dignity in their access to food is central to this reformulation of food and housing policy.

Food policy is ultimately connected to population health—the health care system picks up the tab for food insecurity and poor nutrition in many ways.

Food policy is ultimately connected to population health—the health care system picks up the tab for food insecurity and poor nutrition in many ways. Poor diets lead to additional burdens on our health care system, including obesity, dietary-related disease (diabetes, cancer and heart disease), micro and macro nutritional deficiencies, and poor immunological functioning.[57] A more systematic and comprehensive approach to food and housing has great potential to improve long-run health outcomes. Moreover, the costs of such programs may be greatly offset or even fully recouped by reductions in demand for emergency services or hospitalizations. While this is lightly documented in academic studies and more research is needed, there is evidence that there are huge gains to be had in improved health, reduced drug use, and fewer emergency room visits.

A more integrated approach to housing and food could also make great advances in reducing hunger and improving nutrition and health outcomes. New investments in social housing are needed, including supported housing models for people with health, mental illness and/or addiction issues, as well as affordable housing options for the working poor. A coordinated approach to food programs in social housing is another avenue by which local, sustainable agriculture can be supported. Even outside of social housing with the most vulnerable

55 Vancouver Coastal Health, *Food Security and Housing: Preliminary Rationale and Strategies for the Subsidized Housing Sector* (Population Health Branch, August 2008).

56 C. Miewald, *Food Security and Housing in the Downtown Eastside* (Vancouver Coastal Health, Population Health Branch, September 2009).

57 V. Tarasuk, "Health Consequences of Food Insecurity," presentation at The Social Determinants of Health Across the Life-Span Conference, Toronto, November 2002.

and marginalized individuals, non-profit, multi-unit buildings have great potential to pool resources (through organizations like the BC Non-Profit Housing Association) for bulk purchasing that would lower costs of accessing healthy food.

PUTTING THE PIECES TOGETHER: BELO HORIZONTE

The Brazilian city of Belo Horizonte provides a case study of how food services can be offered that simultaneously meet the needs of vulnerable populations and are culturally appropriate. One form is what the Brazilians call a "popular restaurant," a community-gathering space with an emphasis on food. In order to fully integrate the social justice perspective into the development of a sustainable food system, we need to look beyond food as a commodity, and begin to recognize food production, preparation and distribution as central cultural practices. Belo Horizonte suggests a new model for how effective local government policy can simultaneously address social justice and sustainability concerns.[58]

In 1993, the newly elected municipal government of Belo Horizonte, with a metropolitan population of over 2.2 million, developed a series of projects and policies aimed at reducing food insecurity in the city. Their guiding principle was that "all citizens have the right to adequate quantity and quality of food throughout their lives, and that it is the duty of governments to guarantee this right." These policies have since reached about 38% of the metropolitan population, but have also had significant impacts on rural sustainability.

In 1993, the newly elected municipal government of Belo Horizonte, Brazil, with a metropolitan population of over 2.2 million, developed a series of projects and policies aimed at reducing food insecurity in the city.

First, policies were focused on assisting poor families and individuals; these went beyond the emergency food programs familiar in the Canadian context, and promoted healthy eating habits throughout the city. Second, partnerships with private food suppliers were developed to expand the distribution of healthy food across the city and regulate prices of staples, fruits and vegetables. A third stream focused on increasing food production and supply, providing "technical and financial incentives to small producers, creation of direct links between rural producers and urban consumers, and promotion of community gardens and other forms of urban agriculture."

Because healthy food, such as fruits and vegetables, is usually available only in large supermarkets, access and affordability have been key issues for low-income populations throughout Brazil. Additionally, the small- and medium-scale farmers who produce most of Brazil's fresh produce generally lack the resources to effectively market their crops. However, due to food security policies and programs, Belo Horizonte is currently "the only major Brazilian city in which the commercialization of fresh fruit and vegetables by 'alternative stores' surpasses (by far) the commercialization done through supermarkets."

Municipal food procurement distributes food across three programs:

- "Preventing and Fighting Malnutrition," which distributes free staples through public health clinics, municipal public schools, day-care centres, nursing homes and hospitals;

58 C. Rocha and A. Aranha, *Urban Food Policies and Rural Sustainability—How the Municipal Government of Belo Horizonte, Brazil is Promoting Rural Sustainability* (2003), www.ryerson.ca/foodsecurity/publications/papers/UrbanFoodPolicy.pdf. Quotes in the next paragraphs are from the same source.

- The "School Meals" program, which "provides nutritious meals to children (ages 6 to 14) enrolled in the public school system"; and
- The "Popular Restaurant," a municipally-run, cafeteria-style restaurant located in a central area of Belo Horizonte. By 2002 it was serving 4,800 meals a day, ranging from $0.25 to $0.50 in cost.

Belo Horizonte's strategy has proved immensely successful, both in reaching a broad cross-section of the population, at close to two-fifths of the city's residents, and at addressing both agricultural land-use and equity concerns. Within the limits of municipal capacity and regulatory power, Belo Horizonte addresses the needs of its citizens, not simply by subsidizing food, but by providing inexpensive and nutritious food in culturally appropriate ways.

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Outside Belo Horizonte, and building on regional models, Brazil has made huge strides in combating hunger, as noted by Australian NGO ActionAid's HungerFREE Scorecard, on which Brazil ranks number one:

> *President Lula has demonstrated that great advances in hunger reduction can be made in a very short time, if political will exists. The 'Fome Zero' (Zero Hunger) programme launched an impressive package of policies to address hunger—including cash transfers, food banks, community kitchens, school meals prepared with locally produced food and village markets. The 'Fome Zero' project has reached over 44 million hungry Brazilians. This has helped to reduce child malnutrition by 73 percent.*[59]

59 ActionAid, *Who's Really Fighting Hunger?* (2009), www.actionaid.org.au/index.php/Campaigns/hungerfree-scorecard.html.

PART 5

Conclusion: Talking About a (Food) Revolution

THINKING ABOUT CLIMATE JUSTICE AND FOOD in BC reveals tremendous potential to develop win-win arrangements that cascade across health, education, nutrition, poverty and the environment. Our analysis has attempted to understand the positive benefits of local, sustainable food systems, with a strong public role in growing the local supply chain to overcome market failures in food. At a deeper level, this is more about an ongoing cultural transformation in how we think about food, waste, the economy, health and education.

While abundance of food and low prices would suggest the status quo is fine, we argue that climate change points to the need for a coordinated approach, with leadership from the provincial government.

While abundance of food and low prices would suggest the status quo is fine, we argue that climate change points to the need for a coordinated approach, with leadership from the provincial government, in shaping the food system to be more resilient to climate events, to reduce the "food-print" of our consumption patterns, and to do so in a way that improves, rather than compromises, overall food security. Done well, there are many additional environmental, social and health benefits that can be achieved from a radical restructuring.

We acknowledge the complexity of food and the need for much more research and much more discussion. Our analysis builds on and works with numerous analyses of food security in BC, drawing on the efforts of a large network of food activists, NGOs and academics concerned with various aspects of the food system. However, tensions often exist in grassroots movements between sustainability (local, organic and diverse) and social justice (health, accessibility and affordability) with regards to food security. We hope we have been able to weave these areas together by applying a climate justice lens, and also that this overview is useful in moving forward a meaningful conversation about how to restructure our food system. The "conversation" itself is an important point of moving forward, and that model should be an engaging conversation at the dinner table, not "fast food."

An Alternative Model for Vancouver: New City Market Food Hub

New City Market is a proposed, permanent, centrally-located building intended to be "a physical place designed to drive local food consumption and production by providing a link between the rural supply and the urban demand in Vancouver's Lower Mainland."[a] This food hub model is elaborated in greater detail in a summary report, *New City Market: A Food Hub For Vancouver Visioning Report*, by HB Lanarc Consultants, and addresses the various elements at play in the creation of a food hub.

Based on extensive engagement in Vancouver and research, this model utilizes many of the key elements discussed in the case studies above as well as several new elements, including the cultivation of stronger links with producers, cultural inclusion, innovative governance structures, implementation of the wholesale model, and best practices in communication and design. This approach reflects a similar emphasis seen in Brazil, where the development of a relationship with rural producers helped strengthen food security in Belo Horizonte.

The proposed New City Market reflects an opportunity to connect the elements of sustainability, economic vitality, cultural diversity and social justice, all situated within the unique context of BC's Lower Mainland.

The proposed New City Market reflects an opportunity to connect the elements of sustainability, economic vitality, cultural diversity and social justice, all situated within the unique context of BC's Lower Mainland. While this approach is unique to the large urban centre of Vancouver, it could nonetheless be adapted to smaller cities and towns in BC, based on local needs. At its core it is designed to reflect the economic, regulatory, social and environmental challenges and opportunities at work in BC.

The proposal as conceived envisions the New City Market Hub with the following core characteristics:

- Fill local food infrastructure gaps in the local food value chain by connecting and enabling a spectrum of local food producers, processors and buyers;
- Serve as a local-food, one-stop shop for a wide-range of purchasers;
- Foster the growth of small to medium local businesses across the food and agriculture system;
- Be a centre for innovation and entrepreneurial growth for the local food community;
- Become a locus of celebration and experience making visible local food and agriculture;
- Be a state-of-the-art green building with integrated infrastructure systems; and
- Feature other complementary functions such as office space to serve as a shared facility for food system non-profits and a central resource site for emerging neighbourhood food precincts throughout Vancouver.[b]

[a] HB Lanarc Consultants, *New City Market: A Food Hub For Vancouver Visioning Report*, prepared in collaboration with the Vancouver Farmers Markets, Local Food First, the Vancouver Food Policy Council, and funded by the Real Estate Foundation of BC, April 2010.

[b] Ibid.

RECOMMENDATIONS

Many of the issues we raise in this paper are being studied at the regional and municipal levels in BC. However, key policy levers are provincial in nature. We therefore recommend the following steps be taken by the BC government:

1. DEVELOP A PROVINCIAL CLIMATE AND FOOD PLANNING FRAMEWORK. A top priority is a rethink of BC's food system to be more just, resilient to climate impacts, and sustainable in terms of greenhouse gas emissions. The framework should build on food planning initiatives underway in Metro Vancouver and other parts of BC, and should set targets and timelines for local self-reliance, food system GHG emissions, hunger and nutrition.

2. SHIFT TO 80% FOOD SELF-RELIANCE BY 2030. To be more resilient to climate impacts, BC should steadily increase production for the domestic markets. This will require shifting domestic consumption away from imports, while ensuring balanced trade arrangements to guard against domestic supply disruptions.

3. IMPLEMENT NEW INSTITUTIONAL ARRANGEMENTS. A range of options, such as supply management or cooperatives, are possible to bolster BC's self-reliance and to ensure that agriculture is an economically viable activity. Farmers, distributors and other stakeholders should be engaged in developing the parameters for new institutions.

4. STRIKE A BETTER DEAL FOR FARMWORKERS. Wages, housing and working conditions for farmworkers also need to be improved. The growing numbers of migrant workers should also have opportunities for citizenship.

5. PROTECT AND EXPAND THE AGRICULTURAL LAND RESERVE. Removals from the ALR should cease immediately. Opportunities to bring in additional land under protection should be seized.

6. LINK LOCAL FOOD TO URBAN INSTITUTIONAL BUYERS. Channeling provincial public sector procurement is an essential means of scaling up local, sustainable food. A steadily growing percentage of food budgets should be allocated to the sourcing of local food, and these budgets should also be grown over time. Schools, in particular, are an ideal place to make the connections between community gardens, local agriculture, nutrition, and meal programs.

7. CREATE SUPPORTIVE INFRASTRUCTURE. Strategic interventions can assist small producers to overcome barriers to meeting local demand. Investments in food precincts and hubs, local processing facilities, local abattoirs, food storage and coordinated transportation networks would all foster the development of a local, sustainable food system.

A top priority is a climate and food planning framework for BC's food system to be more just, resilient to climate impacts, and sustainable in terms of greenhouse gas emissions.

8. DEVELOP A NEW FRAMEWORK FOR SUSTAINABLE FISHERIES. As in agriculture, supportive institutions are needed for fisheries, both in terms of the long-term viability of wild fisheries, and to ensure stable incomes for fishers. Developing robust connections to local markets is a priority.

Investments in food precincts and hubs, local processing facilities, local abattoirs, food storage and coordinated transportation networks would all foster the development of a local, sustainable food system.

9. EVALUATE AND SUPPORT RESEARCH IN GHG EMISSION REDUCTIONS IN AGRICULTURE. Direct support for research on GHG mitigation through alternative agricultural practices, specific to the BC context, is needed (for example, UBC Farm). There are also opportunities to pioneer clean energy alternatives to fossil fuels in agricultural buildings, machinery and equipment.

10. TAKE HUNGER OFF THE TABLE. A range of tools are needed to raise the incomes of low-income households. Ensuring workers can earn a living wage and adequate income support programs are essential to reducing hunger. These calculations should explicitly consider food price changes that may arise from the transition to more localized and sustainable food production.

11. SUPPORT INTEGRATED FOOD, HOUSING AND HEALTH PROGRAMMING. Breaking out of silos presents great opportunities to improve the health and quality of life of vulnerable populations. Housing programs should build in flexible food options and infrastructure that meet the social, cultural and nutritional needs of their residents.

THE CLIMATE JUSTICE PROJECT

The Climate Justice Project is a multi-year initiative led by CCPA and the University of British Columbia in collaboration with a large team of academics and community groups from across BC. The project connects the two great "inconvenient truths" of our time: climate change and rising inequality. Its overarching aim is to develop a concrete policy strategy that would see BC meet its targets for reducing greenhouse gas emissions, while simultaneously ensuring that inequality is reduced, and that societal and industrial transitions are just and equitable.

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