

Agriculture on the edge: strategies to abate urban encroachment onto agricultural lands by promoting viable human-scale agriculture as an integral element of urbanization

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In the Greater Vancouver region (Canada) tensions exist where urbanization encroaches onto agricultural land. A recently issued white paper proffered ideas to stimulate discussion on land-use plans and public policies to encourage and enhance agriculture while accommodating a doubling of the region's population. It evoked a visceral response from local and regional politicians, planners and agrolgists who saw it as an heretical attempt to undermine land conservation. Proponents saw innovative strategies to ameliorate entrenched antipathy between competing perspectives. The core arguments and corresponding critique, outlined in this paper, bring to light elements of a broader debate about the vitality and sustainability of agriculture in British Columbia, as elsewhere, centring on issues of food security (supply) and food sovereignty (control) within two competing agricultural paradigms: human-scale agri-food systems and conventional industrial agri-business. Municipal enabled agriculture (MEA) is advanced as a catalyst for the full integration of the agri-food system within the planning, design, function, economy and community of cities and vice versa. MEA can make significant contributions to local and regional economies and has the potential to alter the way communities are designed to reduce unsustainability, planned to incorporate resilience, and organized so that they flourish socially and culturally.

Keywords: food security, food sovereignty, human-scale agriculture, planning, sustainability, urban encroachment

Introduction

Questions of sustainability have come to dominate much of the recent discourse regarding the future of post-industrial society in general and the security of our agri-food systems in particular. Concomitantly, and for the first time in history, the majority of the world's population is urbanized (United Nations, 2007). In Canada, for example, only 3 per cent of the population resides on farms and only 1.4 per cent of the population is engaged in farming (Agriculture and Agrifood Canada, 2002). In other words, the vast majority of Canadians have little or no

meaningful connection to their agri-food system – a consequence of 20th-century industrialization and economic globalization.

While there is a growing recognition of the limitations and challenges that this path is having economically, socially and ecologically, many remain fairly ignorant of the ecological principal and ecological processes that affect every aspect of their daily life. People are becoming increasingly sequestered in cities and insulated from ecological engagement and awareness. More importantly, too many are generally unaware of the ecological burden being imposed upon the earth's resources and systems, despite the fact that most

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would agree that human activity profoundly influences the local, regional and global ecological functions which human welfare is dependent upon. There is perhaps an encouraging trend. We are seeing an expanding discussion of sustainability issues that examines the strategic significance of food security (supply) and food sovereignty (control) (City of Richmond, 2003; Kent Agriculture Advisory Committee, 2004; American Planning Association, 2007; District of Maple Ridge, 2009).

In southwest British Columbia (BC), Canada, as elsewhere, there is a growing awareness that the combined effects of peak oil, peak water, climate change, rapid urbanization, continued population growth as well as the current status, configuration and dominance of conventional industrial agriculture have the potential to undermine the resilience of our cities, threaten food security and ultimately result in an agri-food system that is not sustainable (Rosenweig *et al.*, 2000; Kimbrell, 2002; Heffernan, 2005; British Columbia Ministry of Agriculture and Lands, 2006; Campbell, 2006; Heinberg, 2006; Barlow, 2007; McKibben, 2007; Patal, 2007; Garnett, 2008; Roberts, 2008). Evidence of these forces converging was felt in 2008 with an inflation rate of 1.2 per cent overall, while food costs rose 7.3 per cent, cereal products 12.4 per cent and fruits and vegetables a staggering 26.9 per cent (CBC News, 2008).

Efforts to promote a sustainable agri-food system through the expansion of urban and peri-urban agriculture in our region range in scale from grass-roots activism such as community gardens, SPIN farming (small plot intensive farming) and farmers markets, through design parameters such as green roofs and edible landscaping, to public policy initiatives such as the City of Vancouver's Food Policy Council, (Mendes, 2006), Sustainability Charters proclaimed by several municipalities, Metro Vancouver's Regional Growth Strategy (Metro Vancouver, 2009) and the Agricultural Land Reserve (ALR) legislation enacted by the Government of British Columbia (Provincial Agriculture Land Commission, 2002). In fact, the BC Ministry of Agriculture and Lands' recent publication: *British Columbia Agriculture Plan: Growing a Healthy Future for B.C. Families* (British Columbia Ministry of Agriculture and Lands, 2008a) calls for enhanced community-based/local food systems, addressing food security through diverse local production, environmental stewardship/climate change mitigation and bridging the urban-agriculture divide.

Results are mixed thus far and collectively have yet to yield a resilient, adaptive and sustainable agri-food

system or to cause a consistent, coherent or comprehensive strategy to emerge. We believe the answer lies in part in envisaging and building a municipal-focused agriculture sector in which agriculture and urbanity are inextricably linked via planning and economic strategy (Esseks *et al.*, 2008). We contend that human-scale municipal-focused agriculture should form the basis of a bio-regional agri-food system as a necessary precondition for creating local and regional food security (supply) and food sovereignty (control). This perspective raises several key research questions for us, relating to how food systems should be configured to contribute to more sustainable, liveable urban centres, while enhancing the agri-food sector:

- How might urban and peri-urban agriculture be tied directly into the ecological and social function and economic vitality of our cities?
- How can human-scale agri-food production realize sustainability objectives while contributing to lessening the urban ecological footprint?
- How can human-scale, urban-linked agri-food systems contribute to the social fabric of our cities providing opportunity for productive, healthy human engagement and enterprise?

We explore these questions through a combination of a recent case study and field-based research which is being conducted with private sector, municipal government and community-based partners, in a geographic arena that is struggling to contend with significant growth management challenges.

Metro Vancouver and the Agricultural Land Reserve

In 2009 a white paper entitled *Agriculture on the Edge* (Condon and Mullinix, 2009) was written by two seasoned academics and introduced at a summit of invited regional leaders representing various sectors and interests by a former premier of the Province of British Columbia. The objective of the paper and summit was to stimulate discussion around the inherent tensions that currently exist between rapid urbanization and the encroachment onto land zoned for agriculture in the Metro Vancouver region, and to call attention to the urgent need to abate urban encroachment on agricultural lands by promoting viable agriculture as an integral element of urbanization.

The authors examined the dynamic interplay of competing forces (urban growth vs. preservation of farmland) 'at the edge' and proffered ideas that were intended to

stimulate discussion on potential formulations of land-use plans and public policies that would encourage and enhance agriculture while simultaneously accommodating the anticipated doubling of the region's population over the next 20–30 years (Baxter, 1998). Their concept paper included a provocative suggestion that a 500m zone of land at the interface of the urban and agricultural lands could be considered for an innovative approach to creating enhanced agriculture. The proposal was to capture the 'value lift' on a 200m corridor of the land after it had been rezoned to allow urban development, and use the monies derived from this 'lift' to stimulate and finance enhanced agriculture through a form of 'community trust farming'.

The paper evoked a visceral response from local and regional politicians, planners and agriculturists as well as support from proponents who saw in the proposal innovative strategies to ameliorate the entrenched antipathy between competing perspectives on how growth should be managed in the region and how to integrate *agri-culture* into *urban-culture*. Opponents saw the paper as an heretical attack on scarce and precious farmland and their preservation strategy. The effective rallying cry of a vocal campaign to preserve the ALR has become: no buildings on farmland! While effective as a clarion call, it has done nothing to advance the dialogue.

The essence of *The Edge* paper and the corresponding critique are outlined in the next section. As a case study, it highlights elements of a broader dynamic debate about the vitality and sustainability of agriculture in BC, as elsewhere, that centres on issues of food security (supply) and food sovereignty (control) within two competing agricultural paradigms: human-scale agri-food production and conventional industrial-agricultural production.

We offer a contribution to this dynamic debate with exploratory ideas from an emergent research and development agenda at the Institute for Sustainable Horticulture (Mullinix *et al.*, 2008, 2009) which examines the potential for municipal enabled agriculture (MEA) as a catalyst for the full integration of the agri-food system within the planning, design and function of cities, and vice versa. MEA is defined as agricultural enterprise that is human scale, ecologically sound, in and around cities, for and by communities. We contend that MEA can make a significant contribution to local and regional economies (creating jobs, real wealth and the next generation of urban farmers), and has the potential to alter the way communities of the future are designed to reduce unsustainability (Ehrenfeld, 2009), planned to build-in resilience (Southlands

in Transition, 2009) and organized so that they flourish socially and culturally as sustainable communities.

Agriculture on the edge

The Metro Vancouver region is an amalgamation of 21 cities and municipal districts, encompassing 282 million ha, including 41,000ha of farmland (Figure 1), with a population of 2.1 million. The population is expected to double by 2040. Metro Vancouver has a long and rich agricultural heritage and remains an important element of BC's agriculture sector, currently generating 25 per cent of gross farm receipts from 14 per cent of the agricultural land base. Smaller, family owned and operated farms dominate (88 per cent are less than 26ha), but farm numbers have declined by 25 per cent in the last 10 years. The average age of the region's farmers is 55 years, fewer children are opting to carry on the family tradition, and farmland has become prohibitively expensive for those who are interested in becoming the next generation of farmers (Metro Vancouver, 2007; Pynn, 2008).

The ALR is a precedent-setting provincial regulation intended to conserve agriculture land and enhance agriculture in BC. For the last 30 years it has been a *de facto* urban growth boundary, resulting in our metropolitan areas being significantly more compact than most in North America. While this has been a positive outcome, ALR land values have risen to \$100,000 (Cdn) or more per acre – a cost that cannot be serviced by typical farm receipts.

Although total provincial ALR lands have experienced no net loss (SmartGrowth BC, 2004), a significant portion of prime ALR designated agricultural land within the Metro Vancouver region has been swapped for lesser quality lands in distant regions of the province (Campbell, 2006; Cavendish-Palmer, 2008). Much of the Metro Vancouver region land originally designated to be within the ALR is fragmented and has been abandoned for agricultural purposes, we believe, either because it is too small or otherwise inappropriate for 'industrial' scale agriculture use, because it is being held for speculation, or because it is a land-endowed 'country residence'. Five interrelated factors contribute to this dynamic, each of which threatens the goal of preserving productive agriculture land and providing a significant degree of regional food security:

1. Development pressures are mounting as nearly all of the easily developed sites outside of the ALR are either 'built out' or planned for building.

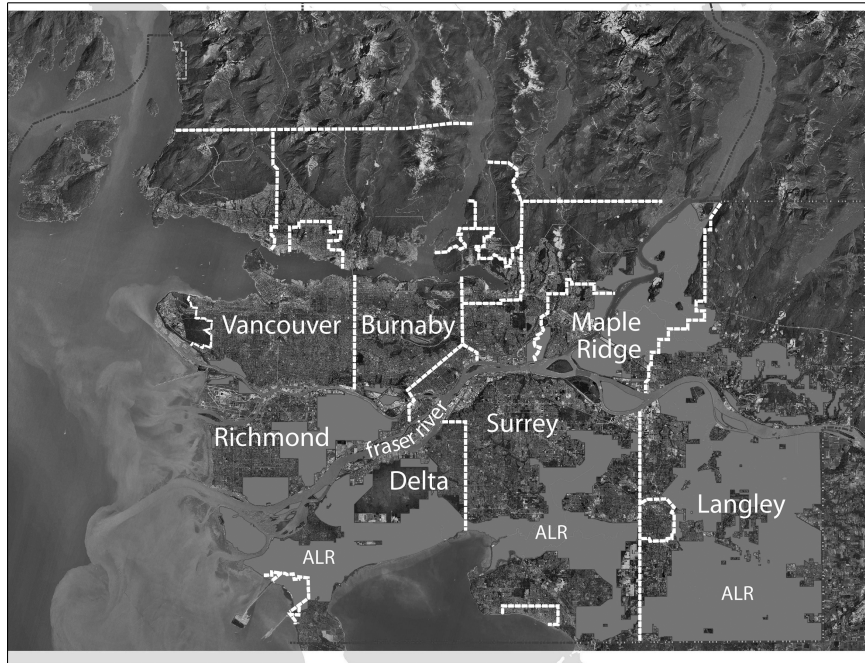


Figure 1 | Satellite photograph of the greater metropolitan Vancouver region of British Columbia, Canada. Major municipal boundaries are delineated by dashed white lines. Urban/suburban areas are evident as dark and mottled with building, roads, etc., while ALR lands are light grey. Note ALR lands are completely surrounded by urban/suburban development. The extensive and significant fragmentation within ALR lands by such things as roads, golf courses, industrial facilities and development is not evident. Mountains are to the north and the Fraser River flows west to the Pacific Ocean.

Source: Metro Vancouver, with permission.

- Developers and local politicians feel there is limited potential for development within existing urban zones (e.g. they consider infill, intensification of existing neighbourhoods or the wholesale reconstruction of existing urban areas to be impractical). Without a substantial change in both the development community and the political culture, this proclivity will probably persist.
2. The preponderance of ALR lands near urbanized areas have been purchased at values or are valued at orders of magnitude higher than can be justified by any form of conventional agriculture utilization (reaching \$100,000 per acre or more). ALR land is clearly being purchased expressly to hold for speculative investment purposes, fully expecting the ALR to break down in the near future. What is more, land speculators are afforded a tax incentive as agricultural lands are taxed on an advantageous scale with very easily satisfied agriculture production and income generation requirements. This makes the cost of holding these lands much more affordable for land development speculators (Penner, 2008).
 3. Municipalities have been granted rights to review ALR exclusion requests before the Agricultural Land Commission (a provincially appointed adjudicating body) makes its decision. Local councils have proved more likely to allow exclusions than have Provincial boards. Local politicians feel pressure to release lands more acutely than distant Provincial regulators, and apparently find it more difficult to deny an application from someone they may know and who may have political influence. Many concerned citizens are now convinced that municipal exclusions drive the system.
 4. The majority of Metro Vancouver agricultural lands that are farmed primarily produce crops (blueberry, cranberry, raspberry, vegetables) for volatile, low-margin commodity markets in the global agri-food system (Table 1). For these, increasingly marginal (and insufficient) returns on investment are often realized (Morton, 2008). Some land is used for producing supply-managed commodities (milk, eggs, poultry) as well as high-value crops (e.g. mushrooms and nursery plants). For the former, strict controls on competition and price structure largely mitigate

Table 1 | Crop production in Metro Vancouver, 2006

Crop type	Land area (ha)			% Change 1996–2006
	1996	2001	2006	
Berries	3300	3940	4643	29%
Blueberries	1506	1746	2734	45%
Cranberries	1218	1505	1503	19%
Strawberries	204	227	208	2%
Raspberries	318	200	198	–38%
Vegetables	2639	3175	3025	13%
Potatoes	2097	2085	2285	8%
Green/wax beans	444	627	804	45%
Sweet corn	366	469	405	10%
Squash/pumpkin/ zucchini	186	308	320	42%
Lettuces	271	282	213	–21%
Cabbage	161	197	97	–40%
Carrots	182	259	196	7%
Spinach	29	58	48	40%
Celery	46	20	7	–85%
Rutabaga/turnip	39	44	45	13%
Chinese cabbage	74	96	105	30%
Nursery crops	1113	1235	1192	7%

Source: Metro Vancouver (2007) Census Bulletin #2 Census of Agriculture.

competitive market forces. Other ALR designated holdings are utilized for low intensity or pseudo-agriculture (e.g. horse stables and ‘hobby farms’) or produce low value per acre crops such as Christmas trees. The majority of Metro Vancouver ALR lands are not farmed for high value local/regional markets which generally provide a high return on investment (British Columbia Ministry of Agriculture and Lands, 2008b). As a result, farms continue to consolidate, fewer and fewer individuals and families farm, and young persons eschew farming/agriculture (Metro Vancouver, 2007). These factors significantly undermine efforts to actualize regional food security and to maintain the economic vitality of the agriculture sector.

5. The interface between lands designated for agricultural use (either in the ALR or zoned for agriculture) and the adjoining developed lands at the urban edge

has become a zone of planning contention and land-use conflict. Those who live on the urban side of an arbitrary boundary (‘hard’ edge) affected by regulation often consider the practices of industrial-scale agri-business as an impediment to their quality of life (Figure 2). At the same time they ascribe high value to the ‘protected agricultural lands’ for their aesthetic importance as pastoral open space. Meanwhile, those attempting to farm the lands on the agricultural side of the arbitrary boundary feel threatened by further urban encroachment that brings with it the pressures of speculation on land value and operational conflicts that often arise with industrial-scale farm practices.

Without doubt, designated ALR lands in southwest BC, particularly those in the Metro Vancouver region, are under substantial threat from urban expansion and other non-agricultural uses (SmartGrowth BC, 2004; Campbell, 2006; Cavendish-Palmer, 2008; Metro Vancouver, 2009). The strategy of relying exclusively on this regulatory tool to ensure land is available for food production and to provide a buffer between agricultural and urban lands has significant limitations, is politically polarizing, and fails to advance regional food security or food sovereignty. Incorporating urban design principles and sustainable land-use practices that integrate human-scale food production with nearby urban settlement (particularly at the urban–ALR ‘edge’) may be a more effective way to resolve this seemingly intransigent problem. Human-scale urban and peri-urban agriculture and related efforts to support the ALR are necessary to reduce unsustainability and contribute to resilience in



Figure 2 | Typical hard edge at the urban settlement and agriculture interface in Metro Vancouver, British Columbia, Canada; it is perfectly suited for the proposed planning tool and human-scale, municipal enabled agriculture

BC, and are prerequisites to creating sustainability and reconnecting urbanity to its roots in the land (Freyfogle, 2001; Carlson, 2008).

Singly and collectively, the aforementioned factors are counterproductive to the long-term preservation of regional agriculture lands and to the creation of a sustainable bio-regional agri-food system. The problem clearly requires rectifying. In doing so we cannot ignore the fact that most of the provincial ALR land at greatest risk today is in fast-growing metropolitan regions and under present circumstances is contributing very little to regional food security. They are lands solely protected by ALR regulations, but not regulated for their agricultural productivity or contribution to regional food security.

New planning tools needed

The intent of the ALR was to promote viable farming, not to function as an urban growth boundary (Smith, 2007). To be fair, this far-thinking and precedent-setting legislation has served to conserve agriculturally useful lands and keep Metro Vancouver more compact than most other North American metropolises. However, it has not facilitated a cessation of urban encroachment by any means and falls far short of promoting food security, food sovereignty and agriculture sector viability. A reasonable trajectory for the ALR is that it is likely to be further compromised, in fits and starts, a few acres at a time, until very little agriculture in Metro Vancouver remains. As such a more substantial and creative action to conserve farmland and promote a viable agri-food sector may be justified. Any such strategy should enhance urban settlement as well.

Such an action would somehow take all five challenges listed above and recombine them to create the economic and social opportunities necessary to effectively solve this conundrum. We elucidate one seemingly radical but practical solution below. We do not offer it as a panacea but as one potential strategy, valuable in (hopefully) an array of strategies and models.

A planning tool proposed

What follows is the outline of a six-element planning strategy to complement and strengthen the ALR. It includes a new zoning designation, transfer of some urban edge land and value lift to agriculture and the public sector, integration of human-scale agriculture with urban dwellers, promotion and support of a new

and critically important agriculture and economic sector and a tangible contribution to regional food security. It assumes that this can be accomplished without public sector tax dollars. The elements of this strategy are:

1. The province, the region, and its member municipalities establish a planning zone of up to 500m wide at the interface between urban and agricultural or preservation lands. Such lands are to be used for both urban and agricultural purposes. Urban uses would presumably be held to 100–200m, with the remainder of the planning zone restricted under covenant for intensive agriculture aimed at local markets.
2. This new band could be rezoned for medium- to high-density living on developed portions. For the sake of this discussion we shall assume a yield of 60 dwelling units per net acre, allowing for significant return on developer investment. Sixty dwelling units per net acre ('net' meaning the number of units per acre on just the development parcels) or 40 dwelling units per acre gross ('gross' meaning the number of units per acre when roads are included in the calculus) would exceed 10 dwelling units per 'double gross' acre ('double gross' meaning the average density when open spaces and agricultural lands are also included in the calculus). Ten to 15 dwelling units per double gross acre is usually considered the minimum density necessary to support viable transit services and local commercial services.
3. Protect, legally and in perpetuity (e.g. via covenant and/or land trust consignment), two-thirds of this land (relinquished by the owner/developer) exclusively for agriculture (Pringle, 1994; Gillon *et al.*, 2006). It may be desirable that designated agriculture land ultimately comes under the ownership of the associated municipality. If it does we refer to this arrangement as Community Trust Farming.
4. Lease (very favourably) these agricultural lands to agricultural entrepreneurs and stipulate they be farmed exclusively for local/regional markets, thus contributing to the sustainability of our communities and to genuine regional food security. Require that labour-intensive, high-value crops and value-added products (e.g. organic, direct marketed) be produced and that labour-intensive highly productive and sustainable production practices be utilized as opposed to capital and input (pesticides, fertilizers, mechanization) intensive industrial methods.

5. Relegate the oversight of these lands to a non-governmental organization (NGO), community/resident associations, or professional consulting agrologists under deed restrictions that would compel use as stated above. It may also be that municipalities will hire professional agriculturists to manage and/or farm these lands.
6. Endow these lands with funds garnered at the time of land sale to support local and sustainable agriculture in perpetuity. Through provincial authorization, local governments already exact a 'Development Cost Charge' from development projects, as a means to finance associated public infrastructure and services requirements associated with municipal growth. Per this scheme the local/regional agri-food system becomes an integral element of municipal growth. Thus it seems reasonable that Development Cost Charge structures could be modified and appropriately used to support the creation and stewardship of municipally focused agri-food system components.

The key

The economic basis for this concept is simple. When lands shift from agricultural to urban use the land values increase substantially. The 'lift' in value can be huge, from a \$40,000 per acre value as agricultural land to over \$1 million per acre as urban land (depending on location and specific development capacity). Typically, the public act of allowing this to occur generates a huge shift in value to land owners and land speculators only, while ignoring or subverting many strongly held citizenry interests, including food security, curtailing urban sprawl, preventing agricultural land loss, and having a viable agriculture sector.

The public sector, however, has the right and ability to change this dynamic by capturing a large portion of the value lift at the time of rezoning application, and using it toward desired ends, which might be Community Trust Farming (Condon and Mullinix, 2009) or another mechanism supporting local food security. If half of the aforementioned value shift is captured through development fees it would generate, for the sake of our discussion, up to or perhaps over \$500,000 per acre. Using this figure, each 10-acre parcel would then provide \$5 million to endow the activities of local agriculturists and Community Trust Farming land management. Invested value capture would generate roughly \$200,000 per annum (depending on contemporary interest rates) to support each 5–7 acres of labour-intensive

and nutrition-rich agriculture operation held and operated in trust. It may also be that some of this captured value can be used to support regional agri-food systems infrastructure and support such as farmers' markets, incubator kitchens and extension research and education support services. Given that intensive, ecologically sound, locally/regionally focused agriculture has difficulty competing economically in the current economic and global agricultural context, some level of support would be beneficial. However the payoff could be large (Kaufman and Bailkey, 2000; Goldberg, 2006).

Food products generated would, per stipulation, only be sold in local/regional markets, making healthy, wholesome, diverse and affordable foods available to a larger number of citizens and putting into place an infrastructure requisite for local/regional food security. The increased nutritional content of sustainably cultivated food crops, a hidden and far-reaching economic benefit to consumers and taxpayers, is now documented. For example organic fruits, vegetables, grains and meats have been routinely found to contain significantly higher levels of various vitamins, minerals and antioxidants (Davis *et al.*, 2004; Benbrook and Greene, 2008; Benbrook *et al.*, 2008).

A substantial and economically robust local/regional agri-food sector would result – one that supports entrepreneurship, small business, creates green jobs and contributes to the regional economy (Tunncliffe, 2007; British Columbia Ministry of Agriculture and Lands, 2008c; Farmers Markets Canada, 2009; Illinois Local and Organic Task Force, 2009). These potential economic and social benefits cannot be overstated (Meter and Rosales, 2001; Korton, 2009). In addition to the straightforward benefits of regional economic diversification, most revenue generated from these farms would stay and circulate within the regional economy, multiplying in value and economic effect, rather than quickly leaving to distant corporate headquarters as is increasingly the case (Heffernan, 2005). Concomitantly, the nature of a community's agriculture sector profoundly influences its social and economic character. Communities dominated by smaller, family-owned farms and agriculturally related business, compared to ones dominated by consolidated, transnational agribusiness, have been found to have overall higher standards of living, lower crime and poverty rates, more retail trade and independent businesses and more parks, schools, churches, newspapers and citizen involvement in democratic processes (Goldschmidt, 1978).

Research also indicates increasing consumer support for small-scale regional/local farming, sustainably produced food products and a willingness to preferentially

patronize them while paying a premium. In the United States, farms of less than 50 acres (human scale, direct market) and those over 2000 acres (consolidated agribusiness) are the only ones prospering and increasing in number. All others are in decline (Kirshenmann, 2004; Kirshenmann *et al.*, 2004). In North America organic food is the only product category in retail food sales experiencing growth, and in Canada farmers market sales now exceed \$3 billion annually (Archibald, 1999; Statistics Canada, 2008; Farmers Markets Canada, 2009). Consumers are now prepared economically and politically to support an agri-food system that is environmentally sound, promotes a sustainable and secure regional food system and contributes to building economically vital and socially coherent communities (Thompson, 2000; Ipsos Reid Public Affairs, 2008). In our proposed scheme, such an agri-food system would emerge without direct taxpayer support. Rather, the support would come exclusively from public capture of a portion of the value lift associated with rezoning and urban development.

Furthermore, the pattern of development could be configured such that the acreages closest to homes would be farmed in the most unobtrusive ways (i.e. labour intensive and reduced chemical use/noise) to reduce potential conflicts between residential uses and agriculture practice. As you move away from homes, larger scale and more mechanized, conventional agriculture would be more suitable. Thus a range of and appropriate complement of agriculture enterprise types could be accommodated in a regional agri-food system. In this new agriculture sector conventional farmers may find opportunity for economically advantageous diversification. Finally, even though new buildings might consume 25–40 per cent of a site that may have been previously allocated to farming (in reality now mostly fallow or leased for conventional farming of low yield/margin products), by requiring small-scale labour-intensive farming on the remaining acres it is likely that the agricultural productivity of these lands, in terms of caloric output and nutritional value, will be many times greater than before (McKibben, 2007).

Reaction to *The Edge* paper

In response to the concepts brought forth in the white paper and summit, the Agriculture Committee of Metro Vancouver directed staff to prepare an analysis for their consideration (Rowen and Duynstee, 2009). Metro Vancouver is an inter-municipal governing body of the Greater Vancouver Regional District,

charged with certain aspects of governance for the metropolitan area. In the report was acknowledgement of the proposed planning tool and paper/summit objectives. However, the analysis contended that it had already been determined that all anticipated growth (to '2041 and beyond') could be accommodated without any encroachment onto agriculture, green space or parklands, thus, seemingly, dismissing any need for such strategies or further discussion altogether. The larger objectives of integrating human-scale agriculture with urbanization and creating a soft interface eluded analysis. The central proposition as to how the edge planning concept might mitigate the intransigence and polarization around the debate while accommodating population growth and enhancing agriculture was dismissed.

The analysts took exception to various assessments of the nature and status of Metro Vancouver agriculture and ALR land utilization while acknowledging that 33 per cent of Metro Vancouver ALR lands are not used for agriculture. They contended (per 'anecdotal evidence') that all farmable lands were satisfactorily and fully utilized. The analysis countered that the nature of our agri-food sector and ALR land utilization patterns were appropriately directed by competitive free market forces and took exception to the notion that prescriptive (planning and policy) approaches to create a sustainable, regional agri-food system were appropriate. Further, the analysts were dubious of claims that intensive, human-scale agriculture could be more productive and valuable.

The core concept was found to be 'inconsistent' with 'sustainability principles' delineated in Metro Vancouver's regional growth strategy (Metro Vancouver, 2009) and supportive of only the first (of six) priorities put forth in Metro Vancouver's *Economic Strategy for Agriculture in the Lower Mainland* (Artemis Agri-Strategy Group, 2002), that priority being the protection of farmland. In the final analysis the planning concept and its objectives were deemed to work against broad regional growth strategy objectives.

The authors of *The Edge* paper were given the opportunity to respond in person to the in-house critique by the Agriculture Committee of Metro Vancouver, with a subsequent invitation to work with an ad hoc planning group to bring forward a revitalized Agriculture Plan for the region. This invitation affords the researchers the opportunity to press the case that new measures are called for if the ALR (with supporting public policies and land-use plans) is to ensure a sustainable bio-regional agri-food system with characteristics such as those delineated in our emergent concept of MEA.

Municipal enabled agriculture

Municipalities have a pivotal role to play in laying the foundations for a sustainable 21st-century urban-centred society in which human-scale agri-food systems are central. Currently, food has become little more than an urban sector throughput – it comes in (in untold quantities and forms) and its waste products (which are many) go out. We have little or nothing to do with its production, processing or marketing. We have no substantive relationship with this omnipresent, universal and fundamentally important aspect of our existence. Yet we know that the negative ecological and social implications of this system are many and great (Kimbrell, 2002; National Farmers Union, 2005a; Mullinix, 2003). It is our fundamental belief that municipalities hold the key to creating local/regional food systems because they represent the level of government that is best situated to effect the needed change, being closest to those for whom such a food system is intended (Mullinix *et al.*, 2008).

We use the concept MEA to describe the full integration of agriculture and the food system within the planning, development and function of our rapidly urbanizing communities. It is an agri-food system element intended to connect urbanites, in real and meaningful ways, to their environment and to a human enterprise that is undeniably crucial to their future well-being. It is a way of reducing vulnerability and dependence on an ecologically unsound and increasingly vulnerable agri-food system while simultaneously reducing our ecological footprint (Mullinix *et al.*, 2009; Sustainable Development Commission, 2009). It also has significant direct economic potential for BC by inverting the local–global dependency ratio. Based on our research and analysis, we contend that human-scale agri-food production can be an effective long-term strategy for strengthening and sustaining our local and regional economies, and enhancing agriculture and urban settlement. Further, we suggest that MEA represents a structured approach that can respond substantively to the economic and resource challenges that will increasingly beset BC particularly in regard to food security (defined in terms of supply), and food sovereignty (defined in terms of control) (Quayle, 1998).

Given western agriculture's record of resource dependence and depletion, ecological devastation and agricultural community devolvement, as well as the interface planning nightmares that beset our towns and cities, we believe that it is critical and timely to challenge the prevailing mindset that sees increased agricultural globalization, industrialization and separation

from urban settlement as a viable path to continue down (Hove, 2004). We depart from convention and suggest that human-scale, agri-food production represents an undervalued economic and community-building force that can transform how we design, plan and support our local communities. To this end, we are working closely with a number of progressive municipalities throughout BC to explore how MEA, as part of a bio-regional agri-food system strategy, can mitigate against the worst impacts of agriculture's environmental, economic and social challenges while at the same time demonstrating practical ways through which to build the workforce (the next generation of urban farmers), the work (food security and agri-food production) and the productivity (urban agriculture as a significant municipal economic engine).

Envisioning a preferred future

The industrialization and globalization of agriculture and the segregation of the vast majority from a relationship to their food production did not just happen by default. It has been planned and envisaged in boardrooms, design studios and through media manipulation (National Farmers Union, 2005b; Patal, 2007). In the same vein, the characteristics of a preferred agri-food system that can guide dialogue and inform regional planning innovation and implementation strategies must also be delineated. Our goal is to provide a focused, compelling and constructive position that will bring stakeholders together in common purpose, objective and effort in the hope that it might lead to a common vision around human-scale agri-food production as an integral part of resilient cities throughout Metro Vancouver and BC. The following describes elements of a preferred human-scale agri-food system within a sustainable bio-regional context:

1. Our agri-food system will be economically robust and will contribute significantly and directly to our local and regional economies.
2. Our urban-focused agriculturists will capture significantly more of the marketplace value of foods and products, at least to levels which afford reasonable rates of return.
3. Our agri-food sector will put many people to work in satisfying jobs. New jobs will be one measure of its economic and social viability and ultimate success.
4. Our agriculture will appeal to a new generation and represent a social and economic sector in which

they feel they can pursue rewarding, satisfying careers, live happy and meaningful lives and contribute to society in valued, personally rewarding ways.

5. Our agriculture engages our urban populace; it is not segregated from the vast majority. Rather it is a fully integrated and positive part of people's everyday lives; it connects people with the means to their sustenance, to the natural world and to each other. It fosters community.
6. Our urban and peri-urban agri-food system is environmentally sound, enhances our natural environment and contributes to the mitigation of environmental degradation. Farmers are recognized as skilled stewards of precious natural resources and farming as a critical, knowledge-intensive and noble profession.
7. Our agriculture will make healthy fresh foods readily available to all and contribute to the mitigation of diet-related disease.
8. Our agriculture, by virtue of how we support it, plan for it, integrate it with other aspects of life and urbanity and relate to it, will in and of itself be an impediment to land speculation, unbridled urban sprawl and loss of arable land. It will enhance urban environs and living.
9. Our region's urban-focused agri-food system will be diverse, multi-dimensional and strive to create and support many new models. Adaptability and resiliency lie in the diversity that affords a multitude of opportunities for response and adaptation.
10. Our agri-food system will genuinely address food security issues, ultimately focus on achieving regional food sovereignty, and thus contribute directly and in substantive ways to urban sustainability.

One of the most significant challenges facing our research team is to demonstrate the credibility of our concept of MEA as well as our vision for a preferred human-scale agri-food system. We are currently working closely with a number of progressive municipalities to explore ways to implement MEA in practical ways. For example, we are laying the foundations for a series of municipally supported farm schools that will help build the next generation of farmers, create jobs and demonstrate how urban agriculture can be a significant economic driver for municipalities. We are also discussing ways by which these concepts can be incorporated into municipal and regional agriculture plans and implementation strategies. In particular, our discussions with senior municipal leaders are directed towards

identifying specific on-the-ground projects that will demonstrate various facets of MEA (e.g. community trust farming, incubator and community farms, community-supported agriculture enterprises, etc.) through a series of 'living laboratories'. We envisage the cumulative results of these initiatives being brought together within networked centres of excellence, culminating in a BC Centre for Human-scale Agriculture. Our current capstone project brings together both the conceptual ideas presented here and a detailed design schema in a substantial land holding (525 acres) which epitomizes the battleground at the urban-agriculture edge. The land, once designated as ALR land and now in private ownership and out of the ALR, is the site of a proposed community with human-scale agri-food production as a central design element that will also be a significant economic driver in the proposed community (Southlands in Transition, 2009). In this project, theory and praxis literally meet 'on the edge'.

Conclusions

It seems inevitable that the concept of sustainability, in all of its dimensions, will come to define and focus human enterprise in the 21st century. The ideas offered in this paper are intended to stimulate creative thinking toward reconciling growth management, food security and the enhancement of agriculture. As the case study from Metro Vancouver illustrates, these are not three separate problems. Rather, they are multiple facets of the same problem. While we recognize that acceptance of our preferred vision may require a substantial paradigm shift, we are reminded of Albert Einstein's sage advice: 'The significant problems we face cannot be solved at the same level of thinking we were at when we created them'.

MEA represents a structured approach that can respond substantively to the economic challenges that will increasingly beset BC (food security defined in terms of supply, and food sovereignty defined in terms of control). We believe that it is important and timely to challenge the prevailing mindset that sees increased consumption as the measure of success, regardless of the implications on the resources depleted, ecological carnage created or the planning nightmares that are besetting our towns and cities. We depart from convention in suggesting that human-scale, agri-food production based on bio-regional rather than geopolitical boundaries represents an undervalued economic force that can transform how we design,

plan and support our local communities. And we are working closely with a number of progressive municipalities throughout BC to explore how MEA can mitigate against the worst impacts of environmental and economic challenges, while at the same time showcasing

practical ways through which to build the workforce (the next generation of urban farmers), the work (food security and agri-food production) and the productivity (urban agriculture as a significant municipal economic engine) that is essential for us to flourish.

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