

Chapter 4

Cultivating Greener, Food-secure Communities

Imagine your community made greener and more abundant in locally grown, readily available food. What might it include? Streets lined with fruit and nut trees, creeks meandering through urban neighborhoods, window boxes bursting with geraniums and fragrant basil, rooftops that host grasses and food production, wildflowers blooming amid rows of houses and vibrant, busy community gardens. Such integration of nature and communities can create healthy, civilizing and enriching places to live (Maller et al. 2005).

As important as envisioning what makes communities more green and abundant is identifying what does not. It is clear that many urban areas lack green space, especially in lower-income neighborhoods, but simply incorporating more flowers and grass is not a sustainable answer. For example, sod strips along boulevards and poorly designed playing fields and parks may soften concrete expanses and offer some recreational value, but demand costly amounts of water, fertilizer,

herbicides and maintenance while contributing little in terms of wildlife habitat and food self-sufficiency.

North American communities of all sizes are waking up to the idea that we can do better. They have absorbed some fundamental insights of *urban ecology*, which studies the relationships between organisms in urban environments and views urbanized environments as part of living ecosystems. These include the recognition that nature, even in urban environments, provides extremely valuable environmental services — like cooling, water filtration, pest control, cleaning of our polluted air and absorption of carbon dioxide to help mitigate climate change. Unlike “conventional” greening, more sustainable approaches to greening take more realistic account of such services.

Moreover, reintegrating nature into our communities promises so much more. We can transcend the alienation between humans and the natural world that is a product of conventional community design, and which lulls many

people into thinking that food comes from supermarkets, water comes from faucets, and wastes are simply taken "away." Reconsidering our communities as living ecosystems also expands our awareness of environmental issues, which we often associate with comparatively remote regions (such as species extinction and oil spills), to include those in our own backyards.

By adopting strategies and techniques that protect and restore ecology, we can reconnect with nature while we green and feed our communities. This chapter explores how communities are significantly enhancing these services through better land-use choices. These include preserving and restoring aquatic areas and open green space sustainably; incorporating site-appropriate plantings and green infrastructure into built environments; and cultivating places to support multiple functions such as food production, wildlife habitat,

recreation and beautification. As citizens and local governments have discovered, getting involved in community gardens, planting trees or participating in stream stewardship projects can improve our health, protect our ecosystem, foster local self-reliance, build community and even provide some of our food needs. After all, who doesn't enjoy a fresh home-grown tomato?

The Case for Greening

Although green spaces and greener infrastructure can certainly make our communities easier on the eyes, they also deliver the following benefits.

Save Money: The economic argument for green space and greener infrastructure is strong. Simply planting trees and using alternative ground cover to sod yields lower water, energy and maintenance. By providing shade, windbreaks and evapotranspiration (lowering

Bioregionalism

The term *bioregionalism* is the idea of being connected to the place we call home. It's about living within the ecological limits of our surrounding environment, thereby ensuring the region's ability to provide services (such as food or clear air and water) in the future (Gray 2007). The term comes from *bio*, the Greek word for "life," and *regio*, Latin for "territory to be ruled." Together they mean "a life-territory, a place defined by its life forms, its topography and its biota, rather than by human dictates; a region governed by nature, not legislature" (Sale 1985). It's a place where humans are part of the natural environment and strive to protect and restore it.

Bioregionalism's long-term goal of self-reliance, where most of the basic necessities of life are produced within the bioregion, is a fundamental concept that

will help us move toward creating sustainable communities (Carr 2004). Having "place-based knowledge" of the surrounding environment (such as cultural history and ecological knowledge), growing your own food or buying locally grown food, participating in political decision-making, as well as investing in the local economy through locally owned banks are all manifestations of bioregionalism. An example of bioregionalism can be observed in New Zealand, where local governments have observed the benefits of ecosystem services and redrawn boundaries based on watersheds (Gray 2007). By doing so, human society can be organized based on the ecological constraints of the watershed and live in a manner that protects and enhances the surrounding environment.

ambient temperatures), properly positioned trees cut about 25 percent of average annual residential energy costs (approximately \$500) over a comparable house in an unsheltered area (USDOE 2005, as cited in Pimentel 2006). Green roofs (discussed later in this chapter) help insulate buildings and lower energy costs.

Regulate Temperatures: Urban areas are significantly hotter than surrounding rural areas. Dark heat-absorbing materials such as concrete and brick, the absence of tree or vegetative cover and waste heat from buildings, industry and automobiles all raise city temperatures. Highrises create an "urban canyon," trapping heat and restricting it from being released into the atmosphere (Alexandri & Jones 2008). In addition to exacerbating the effects of heat waves on public health, this *urban heat island effect* increases demand for air conditioning (Ihara et al. 2008). Scientists estimate the total electricity costs for offsetting the effects of heat islands in the US at more than \$1 billion per year on energy bills (Akbari et al. 2008). Cities can counteract the heat island effect by planting more trees, increasing vegetated land within the city and using light-colored paints and building materials to reduce absorption of solar radiation. A 2006 study conducted in Tokyo suggests that strategic use of vegetation along building walls could reduce air temperature by 1.2 degrees Celsius and energy demands for cooling by 40 percent (Kikagawa et al. 2006).

Conserve Water: Sustainable landscaping, which emphasizes planting of indigenous species or native plants adapted to local climates and leaves some naturally vegetated areas untouched, requires less irrigation than non-native species. It can help communities achieve water conservation goals. Green roofs can also



Fig. 4.1: Living walls or green walls are vertical gardens attached to the exterior or interior of a building. They do more than just beautify — they actually help improve air quality. This "Apartment therapy" by Green over Grey in a West End Vancouver loft incorporated 892 plants from 85 species into an 8'-by-16' wall. (CREDIT: MIKE WEINMASTER, GREEN OVER GREY, LIVING WALLS AND DESIGN INC.)

help communities reach water conservation goals by capturing and filtering rainwater, which can then be used for non-potable uses such as toilet flushing or irrigation.

Absorb Pollutants: Plants absorb carbon dioxide and other climate change-inducing



Fig. 4.2:
Community-supported agriculture programs, like this one at the South Coast Farms in San Juan Capistrano, not only delivers bins of fresh, local produce to subscribers, it also helps support the regional economy, secures the livelihood of local farmers and promotes a greater connection to food.
(CREDIT: JODI LAOGSDON)

pollutants. It is estimated that one tree with a 50 m³ crown sequesters 11 kilograms of carbon a year (Leung et al. 2011).

Host Wildlife and Plants: Wild plant and animal populations have more than intrinsic value; they also serve as important proxy measures of the health and life-supporting capacity of entire ecosystems. But urbanization has radically impacted ecological processes and decimated wildlife habitat by disrupting migratory pathways and fragmenting forests and other ecosystems. Well-designed green space that incorporates the natural features of the area and maintains vegetation biodiversity can provide suitable habitat for breeding, protection from predators and food.

Manage Water Resources: Much of the rain that falls on impervious paved surfaces enters stormwater drains or nearby creeks or streams. Green infrastructure such as green roofs, vegetated swales and rainwater gardens

can capture this stormwater runoff, filter out pollutants and recharge groundwater supplies.

Support Public Health: Community green spaces provide places to play, meditate, gather, rest and rejuvenate. Controlled studies have found that exposure to green space can improve well-being and health through the reduction of stress and mental fatigue (Groenewegen et al. 2006).

Create More Livable Cities and Connect with Nature: Getting involved in ecological restoration brings us closer to the natural environment, enhances our connection with ecological processes and strengthens social capital by creating opportunities to know our neighbors.

Produce Food and Enhance Well-being: Functional green space landscaped with community gardens and food plants enhances food security in our communities, promotes social capital among neighbors and increases the health and well-being of gardeners and their families who benefit from locally grown food. Research by Gorham et al. (2009) showed that residents living close to community gardens felt they contributed to neighborhood revitalization and feelings of safety.

Opportunities for Greening

Where can citizens and local governments get started? Our public green spaces, aquatic systems and community infrastructure, as well as our own home and business spaces, offer fertile territory to cultivate these services.

Greening Parks and Open Spaces

While many neighborhoods need more green space, period, other communities are struggling to overcome the "parks as ornaments, something to look at but not to use" problem.

In either situation, parks and other open spaces are a great place to start rethinking our approaches to green space. They can host numerous activities and features that preserve and build community capital; in particular, its human, social, cultural and natural forms.

Traditionally, parks have been designed and managed by people who lack experience in ecological landscaping or appreciation of the range of opportunities that parks can offer — for recreation, education, naturalist activities, wildlife habitat, farming, community gardens, indigenous species planting and more. Management practices are now changing to deliver multiple services. One of these is Queen's Park in Toronto, Ontario. Its xeriscape garden features 140 drought-resistant plants that are well-suited to the regional climate; its ecological landscaping reduces maintenance, operating and watering costs by about 70 percent (City of Toronto 2011). Local university students and faculty use the garden to conduct projects and experiments, and plants and clippings are available for purchase. Similarly, Loulet Park, an underutilized public park space in North Vancouver, British Columbia, was transformed into an urban farm that provides food for the community, educational opportunities and a place for social capital to grow (Linzey 2011).

In many communities, citizens and non-government organizations are also discovering creative ways to meet local recreational and ecological needs. They're developing and maintaining new green spaces on vacant lots, traffic islands, rooftops and abandoned industrial lands. These open spaces, created by community members, reflect local values because their own sweat and labor are the impetus for implementation.



Fig. 4.3: Traffic circles work to slow traffic in residential neighborhoods. This Vancouver traffic circle was built by the city and planted by local residents.



Fig. 4.4: Creek "daylighting" projects restoring formerly culverted, paved-over streams back to a more natural state to improve aesthetics, increase wildlife habitat, improve water quality and help stormwater surges in urban areas.

(CREDIT: RICHARD REGISTER)

Restoring Urban Aquatic Systems

In urban areas, naturally occurring streams, ponds, beaches and marshes have often been filled in, neglected or manipulated beyond recognition. Protecting and restoring them can revitalize neighborhoods and commercial areas, and give us a place to connect. Healthy

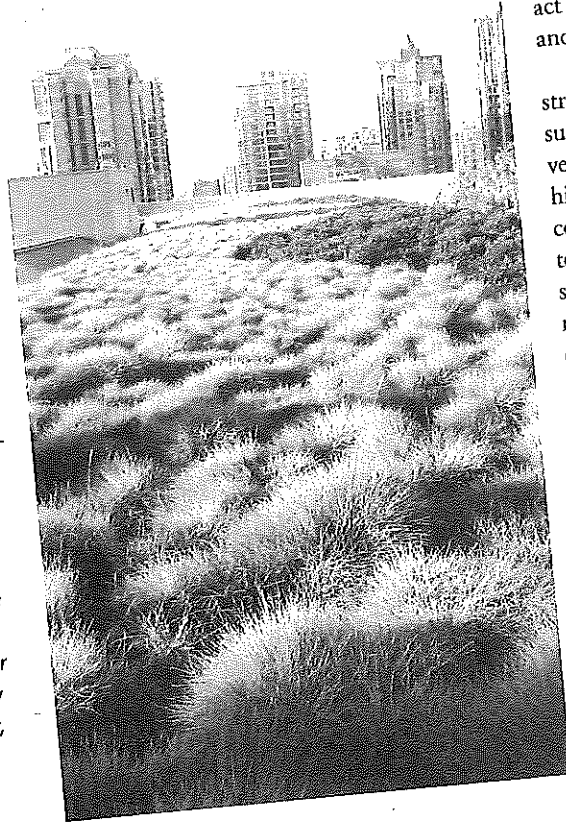
aquatic systems are full of life and offer communities a place for art, science and celebration of nature. Conceived in this way, restoration projects can infuse community activism with a creative and inspirational dimension that has profound implications for grassroots efforts to revitalize our cities.

Stream corridors, creeks and marshes are also vehicles for education about local history and ecology, and places for rest, recreation and neighborhood beautification. Preservation and restoration projects of aquatic systems in urban areas also have numerous ecological benefits: they can increase biodiversity, provide habitat for fish and wildlife, restore native vegetation, act as natural filtration systems for greywater and accommodate stormwater runoff.

Creek daylighting is a powerful restoration strategy. It involves returning creek beds to the surface from their current underground, culverted state. Although up-front costs can be high, the long-term benefits are many. Stream corridors are among the most varied ecosystems, and streams effectively store and absorb stormwater runoff over their vegetated and riparian surfaces. Once stream restoration projects are complete, there are many more activities to be done. Volunteer community groups can organize clean-up and education programs or partner with local governments and others to fund monitoring programs. Citizens can lobby for ordinances that protect riparian zones (through Official Community Plan policies, zoning and environmental protection bylaws, development permit areas, comprehensive development and density bonusing, conservation covenants and so forth). Such measures help us move from private to participatory citizenship, taking responsibility for the local ecosystem in our urban areas. (see Fig. 4.5, color page C-2)

Fig. 4.6:
Renowned landscape architect
Cornelia Hahn
Oberlander
designed this
semi-intensive
green roof for
the Vancouver
Public Library
in Vancouver,
Canada.

(CREDIT:
SARAH RANKIN)



Greening Local Infrastructure

Local governments are increasingly grasping the strategic value of “greening” municipal infrastructure to support and enhance ecological functions of the natural environment. Green infrastructure is lighter, cheaper and smarter than conventional urban infrastructure; roads, sidewalks, parks and stormwater management systems can all be greened (Condon 2010). By maximizing natural ecosystem functions, green infrastructure can reduce the environmental impact of development and significantly reduce construction, maintenance and refurbishment costs.

A potent example is found in green roofs, rooftops that are either fully or partially covered in growing medium and plants. A green roof can be as simple as a two-inch (5 cm) covering of hardy, low-lying succulents, generally termed an “extensive” system, or as complex as a fully accessible park complete with trees, called an “intensive” system. Extensive systems are usually less accessible, non-recreational spaces that provide less variety in vegetation but require less growth medium, less maintenance and less water. Intensive green roofs require more water and maintenance and are generally more expensive than extensive systems, but provide substantial recreational, agricultural and energy-saving benefits (USEPA 2008). Green roofs can also help beautify our communities, providing calm and natural places to relax and socialize, as well as reduce heating and cooling needs (thus reducing our greenhouse gas emissions), mitigate the urban heat island effect, improve air quality indoors and out, filter pollutants, create habitat for small critters and birds, offer places to socialize and host food gardens.

The world leader in green roofs is Germany, where an estimated 10 percent of flat roofs in



Fig. 4.7: The Green Alley project in the midtown area of Detroit revitalizes neglected back alleys into vibrant greenways for pedestrians and bicyclists. Detroit. (CREDIT: PEGGY BRENNAN/GREEN GARAGE)

the country incorporate roof-top gardens; however, they are becoming more popular in North America (USEPA 2008). Chicago has emerged as a leader in this respect by promoting green roof development through incentive programs, such as expedited building permit processes and service-fee waivers for developers installing green roofs (EPA 2008).

Greening our infrastructure can also help us create pleasant new green spaces. In Chicago's eastside, one developer converted a dreary alley adjacent to its urban redevelopment project into a permeable space with courtyards with gardens, park benches and places for people to gather. The City noticed the benefits the alley

Standing on the View

Step out through a hatch onto the roof of the Vancouver Public Library at Library Square — nine stories above downtown — and you'll find yourself in a prairie, not an asphalt wasteland. Sinuous bands of fescues stream across the roof, planted not in flats or containers but into a special mix of soil on the roof. It's a grassland in the sky. At ground level, this 20,000-square-foot garden . . . would be striking enough. High above Vancouver, the effect is almost disorienting. When we go to the rooftops in cities, it's usually to look out at the view. On top of the library, however, I can't help feeling that I'm standing on the view — this unexpected thicket of green, blue and brown grasses in the midst of so much glass and steel and concrete.

Living roofs aren't new. They were common among sod houses on the American prairie, and roofs of turf can still be found on log houses and sheds in northern Europe. But in recent decades, architects, builders and city planners all across the planet have begun turning to green roofs not for their beauty — almost an afterthought — but for their practicality, their ability to mitigate the environmental extremes common on conventional roofs.

To stand on a green roof in Vancouver — or Chicago or Stuttgart or Singapore or Tokyo — is to glimpse how different the roofscapes of our cities might look and to wonder, Why haven't we always built this way?

— Klinkenborg, 2009

brought to the neighborhoods and started a citywide Green Alley pilot program in 2006. By 2008, the program had converted over 3,500 acres of pavement to permeable surfaces, and by 2010, more than 100 green alleys had been created (Buranec 2008; City of Chicago 2011). As we shall see in the extensive discussion on water management in the following chapter, projects like these can also help us manage water resources better, through infiltration of rainwater through rain gardens, permeable surfaces and other modified conveyances that eliminate the need for complex sewer systems to handle large storm events.

Greening Private Spaces

Urban ecology principles can be fruitfully applied to backyards, corporate parks and private gardens. Organizations, such as the Toronto-based non-profit Evergreen, work with businesses on many projects that transform corporate spaces

into green space. Similarly, voluntary programs, such as British Columbia's Naturescape BC, offer pointers on inexpensive ways to restore, preserve and enhance wildlife habitat on private properties. Naturescape's public education materials show how to get squirrels, birds and butterflies to frequent balconies and backyards. Local governments can also promote change through education, incentives and regulations that require alternatives to turf and pesticides.

A growing number of developers, planners and landscape architects are also going green in a meaningful way. Forward-thinking developers are moving to protect existing vegetation in residential housing projects by incorporating trails and nature preserves. They are also using ecological function, such as wetlands and bioswales, to provide surface-water management and other services (See chapter 5). Many businesses are rethinking the concept of corporate office parks. Patagonia's distribution

center in Reno incorporates xeriscaping and green stormwater runoff management into its award-winning design. AT&T converted the manicured lawns at two of its corporate campuses in Illinois into prairie wildflowers, saving about \$75,000 in maintenance, fertilizer and irrigation costs. Similarly, UPS protected creeks and woodlands at its headquarters in Atlanta, Georgia (Rocky Mountain Institute 1997).

Even golf courses — a notoriously unsustainable land use — can be and are being greened. Conventional golf courses carve fairways out of forests and deserts; guzzle massive amounts of fertilizers, pesticides and water to irrigate miles of Kentucky blue grass; and require endless labor to manicure greens and fairways to perfection. Audubon International and other agencies now have programs to assist golf course designers and maintenance staff to create ecologically responsible golf courses. Boardwalks at Squaw Creek Golf Course in Squaw Valley, California, have carried golfers over marsh and meadow areas since its opening in 1992. The owners restored acres of native grasses and enhanced natural filtration ponds that feed Squaw Creek. Audubon certified Squaw Creek as a “cooperative sanctuary,” and apart from using small amounts of nitrogen, the golf course is maintained organically to protect the aquifer it sits upon.

Tools and Initiatives

Voluntary

WATER-EFFICIENT LANDSCAPING

There are numerous communities promoting water efficient landscaping. One study comparing conventional and water-efficient landscapes in Northern California found that

Integrated pest management includes a suite of techniques that, used in combination, seek to minimize or eliminate the use of pesticides and herbicides. Some strategies include: planting pest-resistant species, encouraging beneficial critters like toads and ladybugs, and planting species, such as marigolds, garlic, onion and pansies, which naturally deter insects.

the latter accounted for savings of 54 percent for water, 25 percent for labor, 61 percent for fertilizer, 44 percent for fuel and 22 percent for herbicides (Rocky Mountain Institute 1998). The City of Austin, Texas, has a “Go Green” campaign, which encourages residents to use water-efficient and chemical-free landscaping practices at their homes (City of Austin 2011). It distributes fact sheets identifying good practices for water-efficient landscaping and xeriscaping, and partners with nurseries to train retail staff to advise customers on water-efficient plant selection.

TREES FOR TUCSON

This Tucson, Arizona, program is affiliated with the American Forests’ Global ReLeaf Program. It provides information to homeowners, neighborhood groups and schools on low-water plants and trees appropriate to the local environment. In its first decade of operation (1993-2003), the program provided community members with over 30,000 trees. Organizers calculated that each tree would save more than \$20 in air-conditioning costs by providing shading and evapotranspiration, for a total of \$236.5 million over the next 40 years. Officials also estimated that planting 500,000 trees will save the city \$600,000 in storm drainage

management in 40 years. Programs include Trees for Shade, Trees for the Community, Trees for Schools, Trees for Neighborhoods (Street Trees), Trees for Commemoration, Tree Tours and Tree Care Workshops (TCBI 2011).

GREEN STREET STANDARD PLANS

Green Street Standard Plans were recently completed by the City of Los Angeles (2010) and posted on the Web so that any developer can incorporate them into their designs, get a regular permit and start work. The City-approved plans incorporate best management practices for elements that increase green space and permeable areas with a view to stormwater management and beautification and utilization of neglected space.

GREEN ROOF RESOURCES GUIDE

The City of Los Angeles has also developed a resource guide for individuals and groups interested in developing green roofs in the city. It includes information on how to plan, design and maintain a green roof (City of Los Angeles 2006).

GREEN GUERRILLAS

This organization began in 1973 with a group of neighbors on the lower east side of Manhattan in New York City who were tired of the destruction of their community. In an effort to use community gardening as a tool to reclaim urban land and have people work together, the Green Guerrillas cleaned and greened a vacant lot in an area known as Bum's Row. Today that lot boasts meandering paths, a grape arbor, a pond, flowers, fruits and vegetables. Green Guerrillas now helps over 300 community organizations green lots and install public art in New York City, through

education, organization, advocacy and youth engagement (Green Guerrillas 2011).

GREENING THE GREAT RIVER PARK

Since 1995 in St. Paul Minnesota, over 23,519 volunteers have planted 59,448 native trees and shrubs and restored more than 2,000 acres of land in the Mississippi, Minnesota and St. Croix river valleys. The initial work focused on a mostly privately owned 4.8-kilometer (3-mile) industrial stretch of the Mississippi River. A volunteer design team comprised of a landscape architect, a community representative and an ecologist drafted a plan for each parcel of land and reviewed it with the owner. The success of the initial project led to the creation of the non-profit organization, Great River Greening, in 1999. The program is funded by charitable donations and the state's Environment and Natural Resources Trust Fund (GRG 2011).

CREATIVE COMMUNITY GREEN PROJECT

East Vancouver, BC, has fewer parks per capita than any other neighborhood in the city. Modest funding from local grants and city support helped a group of citizens, including an architect and a landscape architect, come together and convert a vacant lot into a playground and park. With no vegetation or streams on the barren lot, the group found another way to create some connection with nature. A meandering stream was designed and built with mosaic tiles, assisted by a local artist who taught school children and community groups how to create ceramic tile mosaics. Large boulders (free by-products of excavation work) and logs were brought in for children to climb on, and locals planted trees. Over 500 people volunteering more than 4,000 hours made Mosaic Creek Park the pride of the community. It is

truly the pride of the community that built it (City of Vancouver 2011).

CITY GREENING PROJECT

Toronto's Evergreen Brick Works, previously known as the Don Valley Brick Works industrial site, has been transformed into a community gathering center and urban park. The site was developed by the non-profit organization Evergreen in collaboration with the City of Toronto, local schools, businesses and other NGOs to strengthen the relationship between nature, culture and community through experiential learning, collaboration and fun. Nominated in 2010 by National Geographic as a geotourism hotspot, the Brick Works comprises 16 rehabilitated buildings that house a local farmers' market, native plant nursery, office space, event rental space, café and pavilions for outdoor events. The site hosts children's summer camps, workshops and community events; it also includes a 1,858-square-meter native plant demonstration garden as well as 16.5 hectares of ecologically restored parkland (Evergreen 2011).

UPGRADING FROM GRASS

Turenscape, an architecture and landscape design firm based in Beijing, China, demonstrated how agriculture can be integrated into the urban environment to provide food and other ecological services. At the Shengyang Architectural University, rice fields and other native crops are planted on university grounds instead of sod or grass. Rice paddies are irrigated with collected stormwater, which helps manage stormwater runoff, especially during the wet season. Sheep "cut" the grass instead of electric lawn mowers, frogs help control insects, and fish increase the rice fields' productivity. The site

annually hosts planting and harvesting festivals, where students help plant and harvest the rice that is sold as "Golden Rice" in the university canteen and as souvenirs to visitors (Yu 2009).

EDUCATION AND INFORMATION

The City of Portland, Oregon, offers information regarding green roofs and buildings via workshops, ecotours, hotlines and other types of technical assistance as part of their ecoroofs program (City of Portland 2011a).

LAND TRUSTS AND CONSERVATION TRUSTS

Typically funded by government, citizens and/or non-government organizations, community land trusts are effective tools for preserving land. They acquire, hold and/or lease land for social purposes, including affordable housing, parks, preserves, community gardens and farming. (For more information about land trusts, see chapter 10.) In British Columbia, a unique land trust agreement between the District of Saanich and the Capital Regional District saved an abandoned parcel of farmland from being converted into a residential development. The land was bought by the District of Saanich, which created a new zoning legislation it called a Renewal Demonstration Farm Zone. The land was then leased to the Haliburton Community Organic Farm Society to practice and promote sustainable farming, engage community members in sustainable food production, restore and enhance the biodiversity on the farmland, demonstrate the viability of small-scale farming and provide opportunities for education about agro-ecology (Haliburton Farm 2011). Land trusts also exist in the United States, with California having the most — a total of 198 (Land Trust Alliance 2005). In 2009, the Sonoma Land Trust acquired 5,630

acres at the Jenner Headlands, with the support of ten public and private funding partners. As a result, 3,100 acres of redwood and Douglas fir forest, 1,500 acres of rare coastal prairie and eight watersheds of Jenner Headlands will be protected (Land Trust Alliance 2009).

Financial Incentives

REWARDS FOR ECO-FRIENDLY LANDSCAPING

State governments and municipalities are incentivizing greener landscape design. For example, the City of Albuquerque, New Mexico, offers financial incentives to property owners who xeriscape: the city credits water bills 75 cents for every square foot of lawn xeriscaped, to a maximum of 2,000 square feet (Albuquerque Bernalillo County Water Use Authority 2011).

INCENTIVIZING GREEN ROOFS

As part of its Grey to Green initiative, the City of Portland offers property owners and developers that meet its floor-to-area ratio (FAR) bonus policy for central city buildings an incentive to add more ecoroofs. It funds up to \$5 per square foot (which typically amounts to 25 to 100 percent of installation costs) of ecoroof projects (City of Portland 2011a). As of June 2008, New York state law allows New York City building owners who install vegetation on at least half their buildings' available rooftop space to offset, for one year, \$4.50 in property taxes for each square foot of green roof installed. The credit covers about a quarter of the cost of installation and is capped at \$100,000 (New York City 2009). Toronto's Eco-Roof Incentive Program offers grants of \$50 per square meter of greened roof for eligible projects, to a maximum of \$10,000 for single-family homes and \$100,000 for all other buildings (City of Toronto 2011). At UniverCity,

the model sustainable community adjacent to Simon Fraser University in British Columbia, developers are awarded a density bonus of up to 10 percent that use green roof technology to help manage stormwater (UniverCity 2011; read more about UniverCity in chapter 14).

Expenditure

CREEK DAYLIGHTING PROJECT

In El Cerrito, California, the non-profit Urban Creeks Council spearheaded a project to daylight a strip of long-culverted creek as part of a citywide storm drain renovation program. Labor was provided by the East Bay Conservation Corps. The restoration project created gentle meanders, pools and riffles to diversify flow, increase water quality and halt erosion. Banks were stabilized with native plant species. To date, the City of El Cerrito has restored and/or daylighted portions of Baxter Creek at Poinsett, Baxter Creek Gateway Parks and Cerrito Creek at the city's southern boundary (City of El Cerrito 2011).

WATERSHED RESTORATION

The Wheaton Branch restoration is one phase of a larger ongoing watershed restoration of Sligo Creek in Montgomery County, Maryland, by an interdisciplinary team of staff from several public agencies including the Maryland National Capital Park and Planning Commission. Located in a highly urbanized area, 55 percent of Wheaton Branch's watershed is covered by impervious surfaces. The project is addressing everything from control of runoff at the stream headwaters to bank stabilization and fish restocking. Ongoing monitoring confirms that, in addition to improving water quality, the project has re-established native fish species (from 3 in 1988

to 11 in 2011) in the Upper Sligo Creek main stem (Montgomery County 2011).

GREEN ROOF DEMONSTRATION PROJECT

Outside the fifth-floor cafeteria of Atlanta, Georgia's City Hall is the first City-owned green roof in the southeast United States. This 3,000-square-foot green roof is a model for downtown businesses and offers a place for employees to eat, relax and socialize. The city is monitoring the green roof performance in terms of energy efficiency, rainwater retention and plant survival. It is also comparing plant growth in different soil depths (City of Atlanta 2011).

WATER STEWARDSHIP GRANTS

The Community Watershed Stewardship Program is a partnership between Portland's Bureau of Environmental Services and Portland State University. The program engages Portlanders in enhancing the health of local watersheds through property consultations, while promoting public awareness of our connection to these natural systems. Since 1995, it has granted \$885,000 to 192 projects (City of Portland 2011b).

Regulation

Municipal governments play a critical role in the sustainable management of green spaces, and citizens can influence their local officials to act. Efforts can take the form of government policy, bylaws or regulations and/or be driven by NGOs, citizens or private initiatives. Conservation commissions and environmental advisory boards can partner with local organizations and other municipal governments to support local greening. With political will, the options multiply.

ENVIRONMENTALLY SENSITIVE AREAS STRATEGY

Municipal governments can conduct environmentally sensitive area (ESA) studies and inventories to determine where substantial leave-strips, setbacks and protection of green space and watercourses are needed most. In 1994, the City of Burnaby, British Columbia, adopted an ESA strategy that continues to serve as its comprehensive policy framework for environmental sustainability. The strategy applies environmentally sensitive planning and management principles to protect public green lands. Principles include creating a linked ESA network, maintaining larger contiguous public open spaces, preserving ecological continuity, encouraging protective zoning of parklands, achieving zero net-increase of runoff, controlling construction damage, planting native species, protecting micro-habitats and preserving ecological function (City of Burnaby 2011). The city also engages in annual State of the Environment Reporting and partners with local NGOs and other levels of government on initiatives from stream-keeping to land-use planning, and has enacted a watercourse protection bylaw (City of Burnaby 2004).

NATURAL LANDSCAPE PROTECTION BYLAW

Communities can amend existing landscape ordinances to encourage planting native plants. Native planting ordinances can reduce water use and maintenance costs, create wildlife habitat and preserve property values. The City of Toronto, Ontario, has a Ravine and Natural Feature Protection Bylaw that is designed to protect the city's sensitive ravine and wooded ecosystems. The bylaw prohibits planting of identified invasive species on properties near ravines and natural areas, and prohibits any

change or interference with trees or natural land topography (City of Toronto 2011). To support this bylaw, the city encourages property owners to landscape with native plants by offering free consultation services and native plant guides.

XERISCAPE BYLAW

In 1991, Florida passed the first state xeriscape bylaw in the US. It required xeriscaping to be applied to all newly developed and existing public properties over a period of five years. In 2000, the South Florida Water Management District passed a Xeriscape Incentive Rule that provides technical assistance to local governments that submit draft xeriscape ordinances. All local governments that operate water supply

systems in Florida have adopted water conservation ordinances, and even citizens are affected. Anyone who buys an automatic lawn sprinkler must also install a rain sensor to ensure the system shuts off when it begins to rain.

GREEN ROOF BYLAW

In 2009, Toronto became the first city in North America to pass a green roof bylaw. It applies to new commercial, institutional and residential development applications with a minimum gross floor area of 2,000 square meters, and to all new industrial development regardless of size. The bylaw includes a graduated roof coverage requirement ranging from 20 to 60 percent (City of Toronto 2009). Similar laws already exist in Japan, Switzerland, Germany and France. The City of Toronto is also being creative and proactive in greening its own structures: for example, the Eglinton West subway station's tar roof is being transformed into a 9,000-square-foot garden (ICLEI 2011). Leading by example is an excellent way for local governments to promote green infrastructure initiatives.

Strengthening Our Community Food Systems

Most people pay little attention to where their food comes from, but moving toward sustainability requires we do that and more. We need to think about our food as coming from a *food system* that includes everything from tabletop to ground and back again: what we eat; how it's grown, produced, processed, packaged, transported and sold; and what we do with what's left over (Gillard 2011).

As with any system, we should examine where inefficiencies lie with a view to making it more sustainable. According to de la Salle and Holland (2010), North Americans use

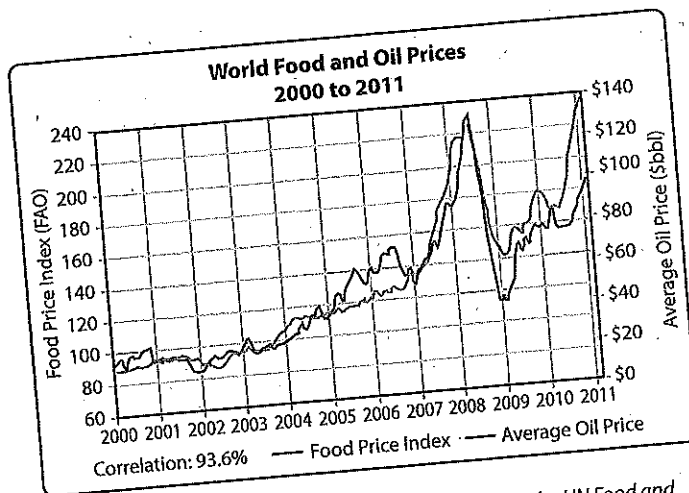


Fig. 4.8: This graph plots world Food Price Index data from the UN Food and Agriculture Organization (FAO) and the monthly average oil price from the US Energy Information Agency (EIA). The strong correlation between the two offers evidence that our food system is heavily dependent on petroleum products. By supporting products and practices that require less energy and produce less waste, we can increase our food security.

(CREDIT: PAUL CHEFURKA PAULCHEFURKA.CA/OIL_FOOD.HTML)

approximately nine times more energy on food production and transportation than the energy they receive from ingesting the food. That means that 90 percent of the energy used to get the food to our dinner tables is lost through energy-intensive farming practices, processing and long-distance transport. This is largely because the food system we have created is heavily dependent on the use of petroleum products to cultivate, process, transport, store and sell our food.

We also need to look at our food system's hidden costs. Weber and Matthews (2008) compared the life-cycle greenhouse gas (GHG) emissions associated with food production against long-distance distribution (aka food-miles) in the US and found that the average US household emits 8.1 tons of food-consumption-related CO₂ emissions annually. Food production practices account for 83 percent of these emissions, while about 15 percent are caused by transportation. However, since different food groups exhibit a large range in GHG-intensity (on average, red meat is around 150 percent more GHG-intensive than chicken or fish), they suggest that "dietary shift can be a more effective means of lowering an average household's food-related climate footprint than 'buying local.' Shifting less than one day per week's worth of calories from red meat and dairy products to chicken, fish, eggs, or a vegetable-based diet achieves more GHG reduction than buying all locally sourced food."

On average in the US, fresh produce in supermarkets travels about 1,500 miles between its points of production and consumption (Hill 2008). Our food system also pollutes the environment with toxic pesticides, threatens biodiversity with genetically modified and non-native food crops and continues to deplete the

world's fish stocks. Because our food system is so globalized, it exploits natural resources and physical labor of other regions, shifting our food security burdens elsewhere.

What would a just, sustainable community food system look like? The University of California's Sustainable Agriculture Research and Education Program defines a sustainable community, or local, food system as a "collaborative network that integrates sustainable food production, processing, distribution, consumption and waste management in order to enhance the environmental, economic and social health of a particular place" (UC SAREP 2011).

Food systems that prioritize sustainable local production of food are inherently tied not only to the health of individuals, but to the short- and long-term economic, social and environmental health of communities. They protect the land that produces the food; support the local economy through local production; empower community well-being through increased health and decreased illness; increase our sense of community; and increase environmental health through reduced production

How Food-secure Are We?

With one of the most abundant food systems in the world, North Americans may believe that food security is mostly a challenge of developing nations. But in 2008, about 43 million US residents of developing nations. But in 2008, about 43 million US residents per month received federal food stamps; more than 75 percent of these were families with young children, and about 30 percent were elderly or disabled people (CBPP 2010). In March 2010, Canada recorded its highest level of food bank use ever: 867,948 people, a 19 percent increase over 2000 levels (Food Banks Canada 2011).

By Spring Gillard

Reflections on Food Sovereignty

My grandparents were the epitome of food self-reliance. Grandma always had a large food garden; she pickled and canned everything, not just fruits and vegetables, but whole chickens from their flock and trout from their pond. She made noodles from scratch for her sublime soups. Grandpa contributed too: he made cheese and sausages, which he smoked in a backyard smokehouse, and grew the grapes for his potent wine. They could put on a banquet at a moment's notice.

My memories of their home sum up food security for me: being completely self-sufficient in terms of your own food supply. The UN definition of food security emphasizes that everyone in a community should have consistent and adequate access to healthy, nutritious, culturally appropriate food. To that I would add: without ever having to ask, "Is this safe to eat?" For me, the term *food security* conjures up visions of lysteriosis or terrorists sabotaging the food supply with anthrax, so I prefer to talk about *food sovereignty* and *food self-reliance*, which requires a resilient food system.

My research and work with the Vancouver Food Policy Council and a community group (the Westside Food Security Collaborative) taught me how vulnerable a food system can be. I learned that, at any one time in British Columbia, there are roughly three days of food on grocery store shelves. I wondered: If food shipments were cut off for reasons like natural disasters or fuel shortages, how would we manage? Although 50 percent of our food is grown in this province, we are still vulnerable. Our government estimates that to produce our food in the next couple of decades, we will need 49 percent more irrigable land under agricultural production. We must protect our farmland, and yet we continue to promote unconscious growth and development.

I decided to take a closer look at my own community's food system, and invited others to join me. Partnering

with the Westside Food Security Collaborative, I developed a series of tours called Exploring the Food System on the West Side. We started with a general exploration of the neighborhood food system and toured several urban farms. Next we visited a working market farm at the University of BC, where, in addition to visiting with the cows and the chickens, we were taught about indigenous food systems by members of the Mayan and Aboriginal gardens. We examined the role of grocery stores in a healthy community and looked at waste. We investigated composting set-ups, from backyard to multi-family (co-ops, apartment buildings) and commercial (restaurants and grocery stores). Finally, we visited our social service agencies to learn more about our emergency and charity food programs. Throughout, we identified our food system's assets and the gaps. We found out that Vancouver's West Side fared pretty well in some areas; for example, we had a lot of food gardeners, and many people were composting. But unless you count chocolateries, bakeries and breweries, we came up short on the processing side.

So what can ordinary citizens do? My tour findings informed a presentation I developed, called Feeding Ourselves: How Do We Fare? In it, I suggest ways to get out and explore your own neighborhoods as I did — and highlight five ways to help strengthen your community's food system:

1. Start, find and get involved with a local group working on food issues. Find out if there is a food policy council in your area, attend a meeting and join in their work. Many North American food policy councils are listed at foodsecurity.org.
2. Explore the food system in your neighborhood or region. What are its assets and gaps? How does your community fare in terms of food security?

If you are working with a community group, try mapping your foodshed: define the geographical and ecological boundaries of the region that grows your food and take stock of its strengths, weaknesses and opportunities to enhance food self-reliance. Learn about indigenous food systems at indigenousfoodsystems.org.

3. Eat local, buy local. Support markets, shops and restaurants that feature local, sustainable foods. Join a community kitchen, food co-op or buying club, or subscribe to a weekly produce box. For local foods near you in the US, check out localharvest.org and sustainabletable.org; in Canada, eatwellguide.org or cog.ca.
4. Grow your own food. Learn how to can, pickle, preserve, bake bread or make cheese. Take a foraging workshop so you can harvest local mushrooms, berries and other wild foods safely.
5. Read *The 100-Mile Diet* (Vintage Canada 2007; published in 2007 by Harmony Books in the US as *Plenty*) if you haven't already. Host a 100-Mile Diet dinner or challenge your family and friends to eat within a designated geographical area or foodshed for a week — or a month. For more dinner ideas, visit eatgrub.org.

of emissions and lower use of fertilizer and pesticides.

The Three Ss: Security, Self-Sufficiency and Sovereignty

When talking about local food systems, one often hears references to the concepts of food security, food self-sufficiency and food sovereignty. According to the United Nations Food and Agriculture Organization, "food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life" (FAO 1996). This concept, based on improving access to food for households and communities, is not concerned with where food comes from or how it is produced.

The question of food self-sufficiency and food sovereignty often arises when thinking about sustainable development. Food

self-sufficiency refers to a community's capacity to meet its food needs using locally available resources. Food sovereignty goes one step further to address how food is produced. According to Wittman et al. (2010), food sovereignty is the right of peoples to control their own food systems, including markets, ecological resources and food cultures. Proponents of food sovereignty advocate the democratization of access to and control over land and other resources (i.e., water, seeds, agricultural knowledge), and also promote agro-ecological production practices that involve a blend of traditional and local knowledge and modern agricultural science to increase food production, preserve genetic and cultural diversity and conserve soil fertility and biodiversity.

Sustainable Food Policy

Community food systems are affected by food policies adopted at levels that range from local

to global. Well-designed food policies can help to encourage sustainability by increasing green spaces and reducing food packaging. They can contribute to the economy by supporting local food producers, processors, distributors and retailers. As well, they can foster social sustainability through community kitchens and nutritional outreach programs.

Some of the aspects of city life that might be touched by food policies include urban agriculture: where food can be grown (in community gardens, on rooftops, on boulevards) and whether or not that food can be sold commercially; farmers' markets: where they can be situated and what bylaws, zoning and permitting might govern them; the allowable size and location of grocery stores; availability of free and low-cost meals; whether or not you can have chickens in your backyard or keep bees; what kind of street food your city offers; the extent of recovery and redistribution of surplus food from grocery stores, restaurants and caterers; the composting of food waste; and institutional food purchasing (Gillard 2011).

Communities are finding creative ways to help their citizens grow and cultivate their own food — plants and proteins alike. Urban bylaws are being adjusted to allow residents to raise chickens and goats, and permit backyard aquaculture. Food policies can support and complement these strategies to increase food security, sovereignty and self-reliance. Measures include protecting existing agricultural parcels through land-use planning, zoning and bylaws; organizing food production, storage, processing and distribution into central locations, such as markets or food hubs that may include restaurants and retail and make food production and consumption the focus of celebration, education and sharing; and developing systems

that repurpose food waste or divert excess to community members in need through low-cost grocers and food banks (de la Salle & Holland 2010; Gillard 2011).

As many communities are discovering, re-localizing food supply chains to enhance local food production and consumption can also stimulate community economic development (DeWeerd 2009; Graham, Healy et al. 2002; Little, Maye et al. 2010; Seyfang 2006; Swenson 2007). For example, in Portland, Oregon, local farmers were missing out on Oregon's \$70-million school lunch market because mass-produced lunch fare could be provided more cheaply. A grant that provided a 7-cents-per-meal subsidy for local produce changed that, ultimately generating an additional 84 cents of in-state economic activity (in wages, upgrades or investments in food production facilities and consumer purchasing) per dollar invested, as compared with the 50 to 60 cents per dollar in incremental economic activity that is usually generated by each dollar spent on a product or service. Children reported that they liked the food better too! (Richardson 2007).

A Bounty of Benefits

Citizens are enhancing their communities' access to locally and sustainably produced food by growing food in every location imaginable — in parks, vacant lots, abandoned industrial lands, rooftops and on vertical surfaces — but they don't always enjoy official support. In some communities, health bylaws still prevent farmers' markets within city limits; other bylaws restrict the use of parks for growing food; codes and covenants favor lawns and parking lots; and real estate development competes with agriculture for land tenure. But many local governments change their tune when

they understand the benefits of stronger community food systems:

Food security: Sustainable community food systems make us all less vulnerable to perils (such as shortages and price increases) of international food systems. Although climate, agriculture limitations and consumer preferences make it unlikely that North American communities will become completely food self-sufficient, it is very possible for communities to increase residents' access to fresh, nutritious and affordable food. Local, community-grown food can help also feed the poor. On the east side of Vancouver, BC, many local gardeners share the fruits of their labor with homeless people, and low-income residents rely on the seasonal bounty of the Strathcona community garden for much of their food supply (Gillard 2011).

Pollution reduction: Sustainable food production lowers food miles, which lowers greenhouse gas emissions, and promotes organic growing methods, which reduces groundwater pollution from chemical pesticides and fertilizers. Home-grown food reduces packaging waste and energy consumption. Organic food waste, which typically accounts for about 30 percent of household waste, can be composted for use in local farms and gardens and thereby reduce the burden on local landfills.

Ecological services: Appropriately sited small-scale agriculture can reduce soil erosion, decrease surface runoff and preserve or increase wildlife habitat.

Economic development: Local food production creates local jobs in food production, processing, delivery, retail, recovery and waste management. It brings entrepreneurial opportunities and keeps money circulating within the community.

Agricultural Urbanism

While community groups and food activists have been working for decades to strengthen the food system, food has been largely missing from official community planning and design processes. *Agricultural urbanism* has emerged as a planning, policy and design framework that promises to help put food back into city-building (de la Salle & Holland 2010). Agricultural urbanism emphasizes ten principles that should inform community food system projects and initiatives: 1) Take an integrated food and agriculture systems perspective; 2) Create a rich experience of food and agriculture; 3) Build on the food and agriculture economy; 4) Increase access to food; 5) Educate about food; 6) Manage to support sustainable food systems; 7) Provide food and habitat for other species; 8) Organize for food; 9) Construct sustainable infrastructure for food and agriculture; and 10) Bring food and agriculture into the full suite of climate change solutions (de la Salle & Holland 2010).



Fig. 4.9: Cascade Community Gardens (Pea Patch) in Seattle's South Lake Union District overflows with produce and flowers. (CREDIT: DAVID ROUSSEAU)

Setting Community Food Projects up for Success

According to Gillard (2011), the most successful community food programs are often multi-layered. For example, they link chefs directly with growers, match a farm with a school lunch program, encourage grocers and caterers to donate their surplus quality food to neighborhood social service agencies for their meal programs or employ and feed the people they serve.

Pothukuchi (2007) observed that successful community food initiatives tend to:

- Show progress in meeting particular community food needs.
- Gain community buy-in and support of activities.
- Adapt effectively to changing and unforeseen conditions.
- Be able to build and strengthen effective community-based networks.
- Develop innovative, multi-sector approaches.
- Build community food leadership.
- Sustain selected activities after start-up funding ends.
- Be able to hit the ground running.



Fig. 4.10: In May 2011, community members began the new Cornerstone community garden space provided by the Chautauqua County Rural Ministry (CCRM), a grassroots organization that helps the homeless, working poor and disenfranchised in Chautauqua County, NY. The CCRM also runs the Chautauqua County Gleaning Project in which volunteers recover unharvested fruits and vegetables from local farm fields for redistribution to food pantries, soup kitchens and community members throughout the county. The Gleaning Project aims to make a healthy impact in the community and the greater movement of alleviating hunger, reducing waste and teaching gardening skills. (CREDIT: SARAH SORCI)

Education: Sustainable community food systems paired with food-related curriculum can encourage healthy eating habits among youth (Hand et al. 2010). Community gardens, farmers' markets and other community food places and events can host workshops and training to citizens for growing, processing, storing and cooking food.

Health and well-being: Successful community food systems reduce food contamination risks of large-scale agriculture processes (APA 2007). They also strengthen community connections to food sources, building trust between food producers and community members through face-to-face interactions at markets and other retail locations. By increasing access to healthy and nutritious food, they help reduce the risk of diet-related chronic diseases. Edible planting and permaculture can enhance our green spaces and promote more environmentally sound landscaping alternatives.

Enhance cultural capital: Strong community food systems support cultural diversity.

Many immigrants are unable to find traditional produce at local grocery stores, or find it at affordable prices. Urban agriculture provides an inexpensive way for people to cultivate traditional foods at home.

Tools and Initiatives

Voluntary

COMMUNITY-SUPPORTED AGRICULTURE

Many urban dwellers are benefiting from community-supported agriculture (CSA), which allows both growers and consumers to share responsibilities of cultivating a vibrant local food system. Typically, local farmers on the urban fringe grow food for a group of city-resident subscribers, who agree to buy it before the growing season begins. By keeping money in the community, this form of agriculture secures the livelihood of local family farmers, supports the local economy, fosters greater self-reliance for food supplies and helps people remain connected with the food they consume. Orti Solidali (or Solidarity Gardens) is a CSA project in Rome, Italy, that works to create more sustainable food systems through agricultural practices and social support. It supports four gardeners who are refugees, and socially disadvantaged youth that have received training in organic agricultural practices. For 300 Euros per year, 60 subscribers receive weekly boxes of fresh produce from its 60 garden plots. Each subscriber is assigned to a specific garden plot and enjoys input into the garden design and cultivation, thereby personalizing their CSA box (Pinto et al. 2010).

EDIBLE SCHOOLYARD

The schoolyard of Martin Luther King Jr. Middle School in Berkeley, California, is not

your typical concrete playground; it's been transformed by students into a garden that produces organically grown fruits and vegetables. These are eventually used in the cafeteria, which is served by a classroom kitchen. Every year, the school introduces over 900 students to the finer points of organic gardening and healthy eating (ESY 2011).

REDISCOVERING INDIGENOUS FOODS

The T'sou-ke First Nation on Vancouver Island, British Columbia, has created a food security program that includes a greenhouse and garden used to grow indigenous food plants. Community members run workshops to teach traditional methods of processing, preparing and preserving traditional foods (CIER & T'sou-ke Nation 2010).

VERTICAL GARDENING

In the United States, Will Allen of the national non-profit organization Growing Power has worked with Kubala Washatko Architects to design a five-story vertical farm. The building, to be sited in Milwaukee's inner city, will grow vegetables, house aquaculture and hydroponic capabilities, capture rainwater for irrigation and provide classrooms for agricultural education. As of this writing, the building is waiting for approval from the Milwaukee Plan Commission (Supan 2011).

BACKYARD AQUACULTURE DEMONSTRATION PROJECT

In Maui County, the University of Hawai'i has partnered with a local high school to create a backyard aquaculture demonstration that trains local residents to grow fresh fish and produce in their backyards. The project enhances food security while helping people rediscover

nutritious and affordable traditional foods and install low-cost, small-scale aquaculture and agriculture systems on their properties. As of 2011, the project had helped ten families install working systems and had secured funding for five more (University of Hawai'i 2011).

HEALTHY COMMUNITY STORES

Community groups are working to improve access to fresh foods, particularly in food "deserts" — areas underserved by quality grocery stores and often home to low-income citizens. In San Francisco, a group of university students collaborated with a corner-store owner to bring fresh fruit and vegetables to a food desert; the store became a pick-up spot for members of a Community Shared Agriculture program (more details below). Today, many stores like this across the US comprise the Healthy Community Stores network (The Food Trust 2011).

FARMERS' MARKET ALTERNATIVES

Some community groups are setting up smaller *pocket markets*: temporary, fresh produce markets that can be offered in food deserts and other key locations like seniors' centers, neighborhood houses, hospitals and churches. Such groups include FoodRoots from Victoria, BC, and Farm to Family of Richmond, BC.

MARRYING SOCIAL AND FOOD SERVICES

In Smithers, BC, a non-profit association of parents (the Grendel Group) lamented the lack of organized opportunities for developmentally delayed kids in their small, remote community. To address this, they developed a catering company called Grendelivery and launched it with funding help from local and regional foundations. Since 2005, Grendelivery

has offered developmentally delayed kids stimulating, supervised social interaction and work experience while providing community members with a simple but tasty rotating menu of order-out lunches and customized menus for catered events. This highly successful program prioritizes produce sourced from local farmers.

CONTRIBUTION AND REHABILITATION

Some inmates at the Leavenworth penitentiary in Kansas maintain a garden where they grow fruits and vegetables for community members in need. The food is given away, and the experience has helped some inmates get jobs after they are released. In 2010, over 80,000 pounds of produce was distributed to feed those in need in the greater Kansas City area. Organizers aim to increase the farm's capacity and produce 200,000 pounds in 2011 (Füssel 2011).

FOOD POLICY ADVOCACY

Food policy organizations are community or regional groups that aim to strengthen local food security. These groups are similar to food policy councils described below, but do not necessarily have a formal liaison to city council. They are essentially vehicles for food activists to advance sustainable food policy projects and programs and connect them with policy-making. Holistic in approach, these organizations address both the causes and effects of hunger and work for short- and long-term change in food production, processing, distribution and access, public education and research and waste reduction. They vary from informal volunteer groups, such as Peterborough's Food Policy Action Coalition, to more established non-profits, such as Toronto's Food Share, which has an executive director, paid staff, a volunteer board and over 2,800 volunteers (Food Share 2009).

Financial Incentives

LOW-COST GROCERY STORES AND CAFÉS

Some regional health authorities are funding initiatives that make healthy food available at subsidized prices. One of these is the Potluck Café, a social enterprise that operates in a low-income neighborhood of Vancouver, BC. It operates a successful catering and event-planning business, hires and trains many local residents with multiple barriers to employment and serves healthy, affordable meals.

TAX INCENTIVES FOR CONVERSION TO URBAN FARMLAND

Faced with a shrinking population, unemployment and poverty, Detroit is using urban farming as a tool for revitalization. The city is capitalizing on some of its 200,000 tax-delinquent parcels of land (approximately 30,000 acres) by providing tax incentives to transform them into profitable urban agricultural farmland. One local initiative, Hantz Farms, has partnered with Michigan State University and the W.K. Kellogg Foundation for added expertise in community food systems, agriculture and soil science. Although still in its infancy, the initiative is expected to bring employment, food security, economic diversification, pollution reduction and tourism to Detroit (Hantz Farms 2011).

Expenditure

FOOD POLICY COUNCILS

Food policy councils are springing up across North America. Some are run by grassroots organizations; others are created by municipal, regional or state governments. The councils are made up of volunteer experts and stakeholders drawn from food-related sectors. Often a paid city staff person or food policy coordinator

serves as liaison (and sometimes referee!) between the council and local government. Councils advise government on food issues, recommend policies, set goals and strategies for achieving them and advocate for communities on food-related issues. Many food policy councils develop food charters that serve as blueprints for just, sustainable community food systems (Gillard 2011). Baltimore is an example of a city with a Food Policy Task Force that aims to create a sustainable community food system (Baltimore 2009).

COMMUNITY GARDEN SPACE

In partnership with the non-profit P-Patch Advisory Council, this City of Seattle program provides more than 23 acres of strictly organic community garden space to 4,400 gardeners in 35 neighborhoods. Special programs serve refugees, low-income, disabled and youth gardeners, and its Lettuce Link project delivers 8 to 10 tons of fresh produce to food banks every year. Since its inception, several community gardens have been started throughout Seattle, along with a community-supported agriculture program (City of Seattle 2011).

Regulatory

FOOD SECURITY BYLAW

Belo Horizonte, Brazil has declared food a human right. It dedicates one percent of its budget to innovative programs like urban farm stands, protein-rich school meals and community restaurants, ensuring that every one of its citizens is fed (Gillard 2011). Its commitment to food sovereignty and to allowing citizens to define their own food and agricultural policies is enshrined in municipal law. Since the bylaw was enacted in 1993, this city of 2.5 million has seen a 75 percent decrease in children

hospitalized for malnutrition and 25 percent decrease of people living in poverty (World Future Council 2009).

URBAN AGRICULTURE BYLAWS

Vancouver, BC, has updated its animal control and zoning bylaws to permit residents to keep beehives and chickens in backyards (City of

Vancouver 2011). Other cities with similar bylaws include New York, Chicago, Portland and Seattle, as well as BC cities including Victoria, Surrey and New Westminster. In 2009, the City of Parksville, BC, amended its zoning bylaw to permit urban property owners to cover up to 20 percent of their land with market gardens (Islands Trust 2011).