Climate change adaptation and mitigation through urban agriculture: A Montréal case study

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Abstract

Climate change is a reality that can no longer afford to be disregarded. Mitigation efforts must be intensified, but it is clear that mitigation alone will not be sufficient to prevent human and ecosystem losses. Adaptation measures must be taken to prepare global populations for the inevitable challenges that will come with shifting climatic zones, changing weather patterns, and more unpredictable and extreme weather events. In Montréal, climate change poses threats to public health, food security, economic development, and the urban infrastructure.

Urban agriculture can help cities address climate change at the local level and prepare urban populations to deal with the challenges it brings. In addition to the many environmental, social, health, and economic benefits is has always brought to cities, urban agriculture now has a role to play as a climate change adaptation strategy. Increasing biologically productive green space will help to relieve the urban heat island effect, serve as a water management strategy, and enhance urban food security. In addition, urban agriculture will help to mitigate further climate change by reducing transportation needs and transforming the current agricultural practices that contribute to global warming. Mitigation remains a crucial aspect of addressing climate change because it reduces the magnitude of future calamities and the need for more drastic adaptation measures.

Urban agriculture in Montréal is relatively well developed in comparison with other North American cities: it manifests itself in community, collective, rooftop, and home gardens; urban farms; community supported agriculture; and public markets that serve as distribution points for local produce. Yet, the policy environment in Montréal is not highly supportive of urban agriculture: the local government does not strive to promote its practice, and does not fully

Urban agriculture
Source: Food & Fertiliser Technology Center

recognise its value to the city. The lack of formal recognition and support creates challenges for urban farmers and gardeners and hinders the progress of urban agriculture at the community level. The existence of barriers, and the opportunities that urban agriculture presents to cities, generates the need and desirability for municipal policy.

Some North American cities have begun to champion urban agriculture and have realised its value as a strategy towards sustainable development, although no local government has yet to develop a comprehensive policy framework on urban agriculture targeted towards climate change adaptation and mitigation.

This paper analyses the state of urban agriculture in Montréal in terms of its physical presence, important stakeholders, policies, and popular attitudes, and draws on urban agriculture policy examples from other cities to argue that the Montréal municipal government should create a supportive policy environment for urban agriculture. A set of recommendations on urban agriculture is proposed for Montréal as a strategy to address climate change.

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Introduction

The discord in urban agriculture (UA) between policy and practice and the largely unacknowledged potential of urban agriculture to address climate change are two considerations which inspired this project. While UA in Montréal is actively practised and promoted at the community level and well-received by the general public, the municipality is for the most part silent on the issue. It was deemed all the more necessary to bring attention to this divide in light of progressing climate change. Urban agriculture has many social, environmental, economic, and health benefits, which have been very well documented. Yet, its potential to address climate change has not been widely recognised. The purpose of this study is to redress this lack of recognition, to show that UA is indeed an effective climate change adaptation and mitigation strategy, and to propose policy measures to implement it as such. The recommended policies are meant to begin a dialogue about how the City of Montréal can integrate UA into its plans and policies; Montréal in turn can act as a model for other cities across Canada and around the world.

From the outset, it is important to distinguish between climate change adaptation and mitigation. Adaptation refers to a process of modifying so as to become suited new conditions (OED 1997); in reference to climate change, it is the process of changing behaviours and practices to address and overcome the challenges brought on by global warming. Mitigation is the act of tempering the severity of or extenuating the gravity of an event (OED 1997). Thus, to mitigate climate change is to attempt to reduce its pace, for example by cutting greenhouse gas emissions.

There is no doubt that climate change is a serious and growing concern for populations worldwide (IPCC 2001). For Montréal, its effects will include higher temperatures in summer

and winter; more erratic and severe precipitation events; increased evaporation; increased tropospheric ozone formation; and greater pollen emissions. These changes imply potentially serious challenges, including but not limited to public health hazards, infrastructure damage, and economic losses (Chan et al. 2007; Allard et al. 2004). Greater food insecurity is another threat that may result from climate change since the current globalised, corporate-controlled agricultural system is vulnerable to shifting climatic zones and changing weather patterns. Urban agriculture has the potential to address these challenges by increasing biologically productive green space in urban areas and cultivating a thriving local food system. At a time when so much energy is devoted to talking about how to deal with climate change, with little action in practice, UA offers a practical approach that simultaneously helps urban populations to adapt to climate change and mitigates further global warming.

Rooftop garden
Source: The Rooftop Garden Project

In Montréal, UA has a long history and solid presence, but remains largely unrecognised at the official level. Yet, its prospects are changing as a result of the actions of multiple actors at the community level. It is now time for the municipal government to step in and play a stronger role in urban agriculture to help community-level actors overcome existing barriers and to unchain its many potential benefits. Impending climate change provides an ever more compelling imperative for action since UA is an essential adaptation and mitigation strategy.

The geographical scale of this study is principally the City of Montréal. Ideally, policies on urban agriculture should be developed and implemented at the level of the metropolitan region, since it is essentially a regional issue. Yet, in practice, this is difficult to accomplish: as most

North American cities, the Montréal metropolitan region is broken up into several autonomous municipalities, which complicates regional planning. Thus, this study focuses on the Montréal municipality, the largest in the region both in terms of its geographical size and population, with the hopes that it can become a leader in addressing climate change through urban agriculture.

This project was undertaken in partnership with the Making Edible Landscapes (MEL) initiative, an ongoing project of the Minimum Cost Housing Group and Urban Design Program at the McGill Schools of Architecture and Urban Planning. The Rooftop Garden Project, jointly run by Alternatives and Santropol Roulant, was also a partner in the collection of empirical data on popular attitudes towards urban agriculture. The methods employed in this study include a literature review, GIS mapping of urban agriculture in Montréal, a survey in the form of face-to-face questionnaires, and interviews with key informants.

The report is organised into four chapters. Chapter I defines UA and explores its role as a climate change adaptation and mitigation strategy as well as its many benefits for local economies, public health, food security, environmental quality, and social cohesion. Chapter II evaluates UA policies in several leading North American cities and brings out elements that may be useful in the Montréal context. Chapter III maps urban agriculture in Montréal in terms of physical spaces, organisations, current municipal policies, and popular attitudes. Chapter IV reiterates the need and desirability of municipal policy on urban agriculture and recommends a policy approach for Montréal to develop urban agriculture as a climate change adaptation and mitigation strategy.

Chapter I

An overview of urban agriculture

Establishing the value of urban agriculture as a climate change adaptation and mitigation strategy is the primary aim of this chapter. It starts with a working definition and short history of urban agriculture; then makes the case for urban agriculture as a strategy to address climate change; considers its additional benefits; addresses the issue of negative impacts; discusses constraints and opportunities; and examines people's motivations to practise urban agriculture.

1.1 What is urban agriculture?

City farming, edible urban landscapes, productive planting: these are all notions associated with urban agriculture. In stricter terms, however, it is useful to refer to the official definition adopted by the International Development Resource Centre, according to which urban agriculture is an activity located within or on the fringe of an urban area, which cultivates, processes, and distributes a diversity products, re-using resources, products, and services found in and around that urban area, and supplies resources, products, and services largely to that urban area (Mougeot 2000). This definition brings out two important concepts in urban agriculture: first, it is a local activity, which uses local resources and produces for a local population; second, it is a closed-loop system, meaning that the by-products of consumption are used as inputs for production. For the purposes of this study, UA will refer to the cultivation, processing, and distribution of fruits and vegetables by individuals, community organisations, and commercial farmers in the urban context. The focus will be chiefly on food cultivation in community, collective, and rooftop gardens; on urban farms, and in residential backyards. Spinoff activities such as the provision of resources for UA and the processing and distribution of end-products will also be considered, as they are important aspects of the food system.

1.2 Food production in historical perspective

Urban agriculture is an age-old practice that dates back to the early cities of the Inca, the Aztec and the Maya, as well as early Javanese and Indus settlements, and of course those in the 'fertile crescent' of the Tigris and Euphrates (Mougeot 1993). In fact, prior to the Industrial Revolution, nearly all agriculture was urban: since there were no means to transport perishable goods over long distances, production was necessarily confined to the fringes of cities. During the 19th and 20th centuries, while pursuing industrialisation, modernisation, and 'progress', agriculture was deliberately dissociated from cities; the practice of urban agriculture was neglected at best, and more often prohibited and suppressed. Several factors explain this divorce between cities and food production (Mougeot 1994). The predominantly held view that nature is incompatible with modern cities, and somehow needs to be tamed, was in part responsible (Luka 2005; Marx 2005). The desire to sanitise cities was another reason for removing agriculture from urban areas (Hodge 2003). Thirdly, in the drive for modernisation, mechanised agricultural practices were welcomed as they allowed large-scale production, thus liberating human and material resources from food production for the pursuit of progress in new domains. As modern industrialised food production and distribution slowly replaced the traditional food system, food ceased to be an urban issue (Bunce 1982). This shift was not considered problematic because a great variety of foodstuffs continued to be available at affordable prices, even as local farmland was disappearing (Pothukuchi and Kaufman 1999). The long-term consequences of the move to a global industrial food system have, however, proven to be extensive and far-reaching. The case can be made that the current food system contributes to health crises, environmental degradation, social injustice and global conflict, and now perhaps most importantly, to climate change (Carlsson-Kanyama 1998; Garnett 1996; Toronto Food Policy Council 1999). Evidence clearly indicates that if it is

not addressed in the immediate future, climate change will have tremendous consequences that will overshadow and exacerbate current problems (IPCC 2001; Warren et al. 2004).

1.3 Urban agriculture as a climate change adaptation and mitigation strategy

There is a stark and intimate relationship between the contemporary food system and climate change. On one hand, modern food production, processing, packaging, and distribution practices have had a notable contribution to climate change. In return, climate change makes the food system vulnerable to disruptions through changing weather patterns and extreme weather events (Rosenzweig and Parry 1994). Undeniably, the transformation of our food system should be a top priority in our efforts to address climate change. The contribution of the food system to climate change has been widely documented. For example, "research from Britain places the food and agricultural sectors' global contribution to greenhouse gas emissions at almost 25% of total emissions" (Toronto Food Policy Council 1999, 26). Energy-intensive production processes and the long-distance transportation of foodstuffs are two important sources of GHG emissions. On average, food production and processing require "20 [calories] of energy to produce 1 [calorie] of food. In comparison, in 1910 this ratio was 1:1" (Holland Barrs 2002, 24). The transportation of foods from fields to processing facilities to supermarkets adds additional embedded energy to the foods we eat. In North America, foodstuffs on average travel more than 2000 km from source to consumer, which costs 10 calories of fossil fuel energy per calorie of food (Ironside 2007; Toronto Food Policy Council 1999). The packaging of food also uses large amounts of petroleum-derived energy and materials. A study of UA in the region of Kingston, Ontario suggested that if 58 common studied food items – which currently travel approximately

4685 km from source to retailers – were to be fully produced locally, a reduction of ~2100 t of annual greenhouse gas emissions could be achieved. To put this number in perspective, it is equivalent to taking ~6700 cars off the road (Lam 2007). Climate change in turn poses serious uncertainties to the global food supply. Shifting climatic zones, changing hydrological patterns, and increased weather variability are predicted to significantly affect farm production and demand adaptation in terms of seeding time, crop varieties, and water management. In addition, the spread of pests and diseases into new climatic zones may result in large-scale crop failures (Rosenzweig and Hillel 1998; Rosenzweig and Parry 1994).

UA is an excellent strategy to address climate change for many reasons. First, it is a highly effective measure with both adaptation and mitigation components. As an adaptation strategy, it plays three vital roles: it improves urban microclimates, increases permeability and water retention, and ensures secure access to a stable food supply. Not only does UA make cities more adaptable and resilient to current climatic conditions, it puts a brake on further global warming by restructuring the global food production and distribution system, thus minimising the need for drastic adaptation measures in the future. In addition, UA has a number of advantages from the policy perspective: it is relatively easy to implement at the local level; it does not entail massive behavioural or infrastructural change; it does not require exorbitant funding; it produces relatively quick results; and it involves citizens in meaningful ways. Although a very local and small-scale activity, UA can have a great influence at the local and global scales, both in terms of climate change adaptation and mitigation.

Potential for urban agriculture

Consider the following examples of how urban agriculture can represent a climate-change adaptation strategy. First, UA can have important benefits for local microclimates by increasing vegetative coverage, surface permeability, and retention of precipitation. In particular, urban agriculture helps to reduce the urban heat island effect (Marsh 2005) – a serious and growing concern in Montréal in the summertime (Chan et at. 2007; Lachance et al. 2006). An urban heat island (UHI) is an area which is significantly warmer than its surroundings, due mostly to the large tracts of mineralised surfaces (e.g. asphalt, concrete) that absorb solar radiation and increase near-surface air temperatures. UHIs are a serious threat to public health, not only because of the direct heat hazard, but also because extreme heat exacerbates air pollution such as sulphur dioxide and ozone and causes excess deaths (Katsouyanni et al. 1993). In addition, UHIs increase energy demands due to the increased use of air conditioning, driving further global warming (Lachance et al. 2006). In numerous studies, vegetation has been shown to be the most effective way to reduce UHIs because it increases the amount of permeable surfaces, raises surface albedo,[1] and cools the air through vegetative transpiration (CRE 2007; Lachance et al. 2006; Rosenfeld 2002; Rosenzweig et al. 2006). Vegetation also improves air quality by trapping particulate matter and other air pollutants.

Increased surface permeability and water retention are also significant in terms of urban infrastructure planning. Climate change is likely to adversely affect urban soils due to increased heat and more frequent and severe precipitation events (Logé 2008). Higher temperatures in the

[1] Albedo is a measure of the extent to which an object reflects solar radiation. Light surfaces and vegetation have a high albedo; they reflect a large percentage of solar radiation back into space. Dark mineralised surfaces, such as tar and asphalt, have a low albedo, and absorb much of the sun's rays, increasing surface air temperature.

summer months will increase evaporation and further dry urban soils, which already receive little hydration due to the high mineralised surface coverage. Drying soil is a particular problem in Montréal; due to its clay composition, it shrinks as it dries and contributes to cracking roads and foundations of buildings (Logé 2008). In addition, more extreme precipitation events brought on by climate change will require cities to increase the capacity of water treatment plants unless other rain water management techniques are implemented. Urban agriculture offers an excellent alternative because it helps to increase soil permeability and water retention and to reduce surface run-off at a modest cost while providing many other benefits. Thus, UA reduces the need for large investments to expand waste water treatment capacity and helps to prevent damage to urban infrastructure.

Another way in which UA serves as a climate-change adaptation strategy is by reducing food insecurity, which is likely to intensify given the anticipated shifts of climatic zones, changing weather patterns, and increasing frequency and severity of extreme weather events. Food security refers to a population's stable physical and economic access to healthy food with minimal reliance on emergency food sources. It is increasingly of concern in major Canadian cities, as noted by Koc et al. (1999, 6): "Far from disappearing, hunger and malnutrition are on the increase, even in advanced industrialised countries like Canada, where each year an estimated 2.5 million people depend on food banks." In Montréal, in the last 20 years, the number of emergency food-aid organisations has exploded to more than 400 (Direction de santé publique 1998). It is estimated that 16% of the Montréal population aged 12 and over cannot procure high-quality nutritious food at an affordable price on a daily basis (Nourrir Montréal 2007a). Climate

Mono-cropping on mega farm
Source: Grinning Planet

change compounds this issue: global food shocks and food insecurity are only likely to increase in the near future as a result of more erratic weather patterns and extreme weather events (Lang 1999). The fact that most of Canada's crops are currently grown on mono-crop mega-farms only increases the risks of crop failures due to droughts, floods, and pest infestations (Knechtel 2007). If that is not worrying enough, approaching peak oil will soon make the transportation of foods across long distances much more expensive, further threatening food security. It stands to reason that cultivating crops in and around urban areas for local consumption reduces vulnerabilities to large-scale crop failures in distant places and the rising cost of transportation associated with post-peak oil, thus improving access to fresh high-quality foods (Armar-Klemesu 2000; Bourque 2000).

A robust climate-change adaptation strategy must also include a mitigation component to reduce the magnitude of the problem in the first place and make the adaptation measures more effective. UA has the potential to do just this by addressing the transportation issue and transforming current production and waste management practices that contribute to climate change; moreover, biologically productive areas also help by acting as carbon sinks. As documented above, the current food distribution system is a major contributor to global climate change. The food system can be made considerably more sustainable by producing foods locally and at a smaller scale. More localised production would greatly diminish the need for packaging, refrigeration, and transportation, reducing the hidden costs and impacts of food, of which climate change is a very significant one (Drescher 2001; Mougeot 1999). Smaller-scale cultivation also facilitates the use of sustainable organic practices, which tend to be less energy-intensive and more effective at

Urban farm in Tokyo

capturing existing atmospheric carbon dioxide. By some estimates, "energy use in sustainable agricultural systems may be reduced by up to 60%, depending on the region and production method, thereby producing less $C0_2$ to begin with" (Toronto Food Policy Council 1999, 29). There is also mounting evidence that organic farming is highly effective at tapping $C0_2$. In fact, city farms can be more effective than city trees in trapping greenhouse gases (Toronto Food Policy Council 1999, 29). Because agricultural activities keep ecosystems in continuous growth phase, at which the rate of carbon capture is highest, productive growing is an even more effective carbon sink than natural ecosystems (Deelstra and Girardet 2000, 53). Additionally, UA can help to transform current waste management practices, which also contribute significantly to climate change. In most North American cities – Montréal included – organic waste is dumped in landfills with all other garbage, where, deprived of oxygen and contaminated by toxic substances, it releases methane, a gas that is about 20 times more powerful than carbon dioxide in terms of its global warming impacts (Roberts 2001). Although modern landfills are equipped with methane capitation systems, they are nonetheless significant methane emitters. By properly composting organic waste, not only can we avert large emissions of methane into the atmosphere, but also produce organic fertiliser, which is a valuable resource in UA.

From a policy perspective, UA has a number of advantages. First, it is relatively simple to implement politically, as the decision-making and implementation occur at the local level, without the need for global or even countrywide policy coordination. Supporting local food production is also unlikely to be a highly controversial issue because it does not oblige citizens to any actions or place direct costs in the form of fees or taxes. Rather, a supportive policy

Vegetable garden

Rooftop garden
Source: The Rooftop Garden Project

environment gives an opportunity to those who are willing to get involved in UA. The controversies that UA is likely to bring up – such as potential nuisance effects, visual unsightliness, or its effect on land values – are relatively easier to contend with than other issues such as road taxation or investment in new transportation infrastructure. Although UA policy development and implementation certainly require a strong will from the municipal government, UA is not likely to run into major political barriers if that will exists. Second, the implementation of UA does not entail massive behavioural or infrastructural change. A policy environment supportive of UA does require municipal commitment, but not social transformation; for city residents, it opens doors without forcing people to take actions or dramatically change their behaviour. Given that many city residents and community organisations are already eager to cultivate farms and gardens in the city, an enabling policy environment and active support from municipal governments will go a long way to ensure that UA will spread and bring about desired results. In addition, UA does not entail major investment in infrastructure. It is a highly flexible activity that can take place in the nooks and crannies of cities: on vacant lots, along the sides of buildings, and in underused spaces on roofs and terraces; experience by the Rooftop Garden Project shows that these spaces can be creatively used for food production without major investment or changes to infrastructure (Hautecoeur 2008). Third, in consequence to the latter point, UA does not require exorbitant funding and ranks high on cost-effectiveness (Petts 2002; Roberts 2001). Land, water, technical support, and adequate micro-scale composting facilities are the basics that cities need to help provide. Although UA can be expensive, experience demonstrates that it does not need to be (Bhatt and Kongshaug 2005; Alward et al. 1976). For

example, soil decontamination can be very costly, but growing techniques such as above-ground planters and hydroponics allow even contaminated land to be used for food production.

Hydroponics
Source: The Rooftop Garden Project

There are two additional reasons to consider UA as a climate change adaptation strategy. It produces relatively quick results because food gardens are relatively easy and inexpensive to start. They can therefore be realised within relatively short time horizons with modest assistance from municipal governments. In addition, UA produces almost immediate benefits. As soon as land and other necessary resources are secured – in the span of one growing season – urban environments become greener and cooler in the summertime; the supply of fresh local food increases; the demand for imported foodstuffs is diminished; and GHG emissions are reduced. Finally, UA involves citizens in meaningful ways. At a time when many people feel powerless in the face of looming climate change (Guggenheim 2006), UA offers a practical way for individuals to address the problem. For those who are eager to work towards a solution on climate change, UA allows them to make a real difference of local and global significance. For others, UA can serve as a means to raise awareness about climate change and consolidate public support for taking action on the issue.

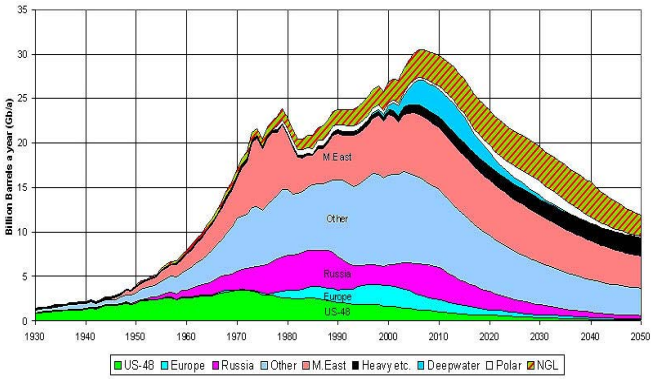
1.4 The unsustainability of the current food system: a broader perspective

As well as being an excellent climate change adaptation strategy, UA also has the potential to address a number of other pressing concerns that arise out of the current food system. To appreciate the full value of UA as a response to the status quo, the state of the current food system in the Canadian city merits examination. Agricultural industrialisation and globalisation

have resulted in many unintended negative consequences, many of which are now becoming starkly apparent: “Questions can be raised about the long-term economic, ecological, and political sustainability of the so-called success of the current food system, with its global division of labour, commodified food economy, increasing regional specialisation, industrialised agriculture, and transcontinental networks of distribution” (Koc, MacRae et al. 1999, 9). Simply put, the modern global industrial food system is environmentally unsustainable, socially unjust, and vulnerable to global economic and political shocks. These claims are outlined in the following paragraphs.

In terms of environmental sustainability, the current food system in Canadian cities fails on several fronts. Its heavy dependence on petroleum for everything from production to processing, packaging, and distribution is a major concern. It contributes not only to climate change, but also to environmental degradation more generally. Mechanised food production and processing and long-distance transportation generate air pollution, which is responsible for respiratory illnesses, acid rain, and other environmental problems. The need to package food in order to transport them over large distances also creates vast amounts of non-biodegradable waste that occupies large tracts of land in the form of landfills (Bhatt and Kongshaug 2005).

The great reliance of the food system on petroleum is especially worrying in light of approaching peak oil. There is a growing consensus among experts that world petroleum production will peak sometime in the next decade, and some believe that it has already peaked: “According to an increasing number of petroleum analysts, we seem to be facing an undulating plateau of world



Oil and gas production curve
Source: Association for the Study of Peak Oil, 2004

oil production from 2007 onward, with permanent decline likely underway by 2010" (Lerch, 2007, 12; Campbell and Laherrère 1998). Declining petroleum supplies and higher prices will have a grave and permanent impact on the Canadian food system, as elsewhere in the world. Food production will necessarily have to become more local. The sooner we begin to restructure the food system, the better we will be able to prevent a looming food crisis, avoid political conflict, and adapt to a post-carbon reality.

The use of synthetic fertilisers and pesticides is a further concern for the environment given the ways in which they degrade soil quality and contribute to water and air pollution (Holland Barrs 2002; Pothukuchi and Kaufman 1999; Toronto Food Policy Council 1999). The toxic petrochemicals applied to farm fields affect the quality of produce, and filter down though waterways and along prevailing wind paths, posing a threat to the health of wildlife and human beings and disrupting ecosystem functions. An estimated 24 billion tons of topsoil is lost each year worldwide as a result of artificial fertilisers and inappropriate farming practices (Holland Barrs 2002, 24). While the world population and demand for food continue to increase, maintaining current levels of food production using current practices will become increasingly difficult (Kaethler 2006). Furthermore, it will undermine our ability to satisfy the global food demand in the future.

Another significant environmental impact of the contemporary agricultural practices results from mono-cropping. A great majority of our food comes from mega-farms, which typically plant one species of one type of crop on large swaths of land and eradicate all other species (Holland Barrs

Mono-cropping

2002). This practice not only reduces local biodiversity, but also increases the reliance on synthetic fertilisers, herbicides, and pesticides because the natural ecosystem is simplified to the point where it is no longer able to maintain its ecological equilibrium. For this reason, mono-cropping also increases the risk of large crop failures and raises questions about the security of the food supply. One need only think of the catastrophic effects of the Irish potato famine in the mid-19th century to appreciate the gravity of this issue.

An additional set of issues arises when we consider the perspective of the farmer: "Corporate food production is damaging to local rural economies, drives diversified farming operations out of business, and forces farmers into contract farming that leaves them vulnerable to layoffs" (Canton Campbell 2004, 345). Emerging monopolies in farming inputs, technologies, and retail; corporate demand for product uniformity; and artificially low food prices due to government subsidies and the externalisation of environmental costs by corporate mega-farms make independent farming operations increasingly unprofitable and economically unstable (Bélanger and Iarocci 2007; Bunce 1982; Ilbery and Bowler 1998; Mak 2000 [1996]). Often, the only option for indebted farmers is contract work for corporate mega-farms, where they perform agricultural practices that can be hazardous to their health.

The interests of consumers are hardly well served by the contemporary North American food system, either. Behind the apparent variety of foods on supermarket shelves at affordable prices lurks a gloomy picture. Much of the food we eat is highly processed and refined, and contains many chemical additives (Holland Barrs 2002). The nutritional quality of 'fresh' fruits and

Supermarket shelves

vegetables is also compromised by synthetic preservatives, which are applied to increase their shelf life, and by the long distances over which they are transported. Food is now quite literally bred to be durable; it is harvested before ripening to survive long-distance travel, resulting in lower nutritional quality and poorer taste (Lister 2007). Genetic modification of produce is an additional concern, the ramifications of which remain largely unknown. Most consumers are psychologically removed from food production and unaware of these realities. The costs of our contemporary food system are reflected in diet-related health problems such as obesity, heart disease, diabetes, and cancer (Canton Campbell 2004); for example, "The US surgeon general's 1988 *Report on Nutrition and Health* estimated that 10,000 cancer deaths are caused annually by food additives alone" (Holland Barrs 2002, 24).

1.5 Urban agriculture as a response to the current food system

In light of these realities, UA offers a promise of greater self-reliance, political and economic stability, social justice, and food security. The fact that UA can produce a number of significant benefits aside from climate change adaptation is yet another reason for promoting it in policy and practice. Not only is it a cost-effective way to address interconnected and complex urban problems, UA is also likely to be a relatively uncontroversial issue because groups with varying and perhaps even conflicting interests are better able to agree on a policy from which they all benefit in some way. There are a number of widely-observed benefits of UA for the urban quality of life.

Urban economic development

The food sector is an important urban economic activity often overlooked by planners and economists. Even though the Montréal food industry accounts for more than 6800 food processing and distribution firms, which sustain about 120,000 jobs (Nourrir Montréal 2007a), the Montréal Master Plan makes no mention of the food system, let alone recognising it as an important economic sector for the city. The case is similar in Toronto (Roberts 2001) and other North American cities. That the food industry should not be taken for granted is revealed by the evidence presented above, and because continued globalisation threatens local food industries, pushing small firms out of business, reducing local employment opportunities, and undermining the capacity of the food sector to feed the local population (Nourrir Montréal 2007a). As oil production declines, a thriving local food sector will be all the more crucial to continue to provide an adequate and affordable food supply to urban populations; in effect, now is the time to start cultivating the local food sector. Urban agriculture is an all-important step in this direction. It can generate new employment opportunities such as urban farming, production and distribution of resources for urban farmers, horticulture experts, food processing, and retail of local foodstuffs; maintain a stable municipal tax base; and create a local buffer against global food shocks. A thriving local food industry can reduce unemployment and poverty and improve food security, thus enhancing the overall quality of life in urban areas.

Neighbourhood revitalisation

Local-scale farming and gardening activities can be a motor for the revival of neighbourhoods that are stagnant or in decline. Such neighbourhoods often have a large number of vacant lots

Action Communiterre collective garden

and a high rate of unemployment, all of which can be put to good use in UA, increasing small-scale economic activity, giving purpose to the underused areas which may be deemed unsafe, reinforcing community networks, and beginning a cycle of increased public and private investment. "Economic development and community revitalisation are achieved when neighbourhoods take pride in a community garden, when inner-city residents gain the ability to grow and market their own food, and when inner-city farmers' markets provide new opportunities for entrepreneurs and commercial farmers" (Carter 2003, 3). Not only does UA improve the physical appearance and everyday safety of a neighbourhood by increasing the level of activity on the street, it is also an excellent approach to open space management from a financial point of view. It is less expensive for the city to maintain an urban farm or garden than a park. In addition, UA can generate tax revenues for the city and create employment opportunities that benefit everyone. Contrary to the belief that UA depreciates property values, it can actually be a strategy to enhance the value of adjacent lots (Been and Voicu 2006 in Holland Barrs 2007).

Environmental quality

Aside from all the environmental benefits related to climate change, UA can enhance urban environmental quality in a number of other ways. First, UA increases the amount of green space in the city, which improves air quality; it also increases water retention and serves as a stormwater management technique; and creates new habitats for enhanced biodiversity (Bourque 2000). Second, local food production reduces the need for packaging, thus decreasing the amount of non-biodegradable waste going to municipal landfills. Thirdly, numerous benefits arise from

Neighbourhood composting operation

the closed-loop system of food production and waste management (Lowe 1996; Luka 2005). With proper technologies and management, waste water can be recycled and reused on a local scale, reducing the need for expensive water treatment facilities. Organic solid waste can equally be recycled locally, eliminating the need for the transportation of waste to landfills, reducing the amount of land and resources currently used for landfills, and cutting the amount of toxic leachate released from landfills (Toronto Food Policy Council 1999). The need for organic fertiliser in urban farms and gardens creates a demand for compost, thus enabling large-scale profitable composting operations in close proximity to urban centres (Mougeot 1994; Quon 1999).

Public health

In North America, diet-related health disorders are on the rise, costing people lives, and governments millions of dollars in health-care costs. “Low-income neighbourhood residents, [especially,] find themselves with few healthful food options and are at increasing risk for diet-related health problems such as diabetes, hypertension, and obesity” (Caton Campbell 2004, 348). UA can help people make more nutritious food choices by increasing the supply of fresh organic food and by psychologically reconnecting the urban population with food through exposure and learning opportunities. In addition, gardening is a hobby that many enjoy. As a recreation activity, it improves people’s physical and mental health through exercise and involvement in a gratifying activity (Bourque 2000). For the growing elderly population, in particular, gardening can be a way to stay active and alleviate isolation. Gardening can also be

used as therapy, in addiction rehabilitation, and in hospitals for chronically ill patients, providing recreation and securing access to fresh healthy food for vulnerable populations.

Social inclusion

Community-oriented UA can be a powerful tool for social development. Urban gardens are community spaces where people can interact and learn from each other. Gardening is a universal activity that can bring together people of all ages, cultures, backgrounds, and physical capabilities. For a city with a high immigrant population such as Montréal, the opportunity for intercultural exchanges in a neutral environment can be especially valuable (Direction de santé publique 2001). Working together and sharing knowledge offers city residents an opportunity to develop stronger ties with their neighbours; gain a sense of self-satisfaction and empowerment; and overcome isolation and social exclusion (Carter 2003). Strong social networks and pride in one's community can in turn help to reduce crime (City of Vancouver 2007; Holland Barrs 2007) and enhance social cohesion and quality of life in city neighbourhoods.

1.6 Pitfalls, adverse impacts, and mitigation measures

Urban agriculture can benefit cities in many ways, but it can also create health and environmental hazards if not properly managed. For example, UA may have detrimental effects if soils or irrigation water are contaminated beforehand, or if organic waste used as fertiliser is improperly treated. Air pollution from traffic may have adverse impacts on produce, and there are the nuisance effects where cultivation areas are allowed to become breeding grounds for urban pests and diseases. All of these concerns are legitimate and they must be anticipated and

addressed through policy (Mougeot 2000). Rather than being seen as an argument against UA, the potential for negative impacts is precisely why UA policy is needed. Only through formal recognition and an established regulatory framework – not through benign neglect and sanction – can such impacts be mitigated.

Urban agriculture is an excellent sustainability strategy because it offers the opportunity to reuse organic waste and recycle wastewater at a local scale, thus creating closed-loop systems and minimising the need to transport by-products. However, proper management is required to avoid breakouts of pests and diseases, food contamination, and pollution of soil, water, and air. For instance, composting facilities that are improperly designed and managed can attract rodents such as mice and rats, which are not generally drawn to food and garden waste, but which are attracted by other types of kitchen waste (Holland Barrs 2002, 54). Poorly-treated domestic waste can lead to the transmission of diseases and contamination of food (Quon 1999, 8). Of course, soil contamination from previous industrial activities or the use of agrochemicals is another source of concern. In short, an anticipatory approach needs to take into account the past uses of the land being considered for UA and outline a comprehensive strategy of adaptive reuse for productive planting.

Finally, it needs to be noted that many potential nuisance effects are exaggerated or altogether based on biases rooted in the popular perception that urban and agricultural activities are simply incompatible (Quon 1999). For example, urban dwellers may oppose UA on the grounds that it is visually unappealing or negatively affects land values. As already noted, however, UA can help

to revive derelict lands, enhance the quality of urban environments, and even increase adjacent land values (Brown 2003; Holland Barrs 2007; Lachance 2004). Although negative perceptions can stand in the way of progress in UA, they can also be changed through education and awareness initiatives, and especially through high-visibility demonstration projects. A survey of 26 urban planning professionals from 18 cities around the world showed that only a few respondents were concerned that UA might degrade the environment or cause other nuisances (Quon 1999, 27). On the one hand, this is positive because it suggests that planners are open to encouraging UA activities in their cities; on the other hand, planning professionals need to be aware of and understand potential negative impacts in order to take appropriate mitigation measures and avoid possible problems.

Although there are potential negative effects of UA, these do not justify the continued banning of food growing operations from cities. Many of these potential hazards are based on popular biases, and others can be mitigated with proper precautions. Historical experience shows that UA will continue to be practised whether officially recognised or prohibited (Bhatt and Kongshaug 2005). By shunning UA, cities not only lose out on the many benefits that accrue from growing food locally, they also forgo the ability to address potential negative impacts. Thus, rather than being a reason to avoid UA, potential negative impacts further justify the need for an urban food systems policy that incorporates agriculture.

1.7 Constraints and opportunities

UA can offer great benefits to cities, but a number of constraints need to be overcome to realise these benefits. The major challenge thwarting UA, and underlying all other constraints, is the lack of official recognition and support. Some see the food system as an altogether insignificant urban issue, and do not believe that UA deserves attention in the same ways as housing, crime, or transportation (Pothukuchi and Kaufman 1999). Others may view UA "as a backward activity, one that gives a community an unprogressive air, detracting from the prosperity that comes of industrialisation" (Quon 1999, 26). Agriculture and urbanisation may continue to been seen as conflicting in contexts where any non-built use of land is seen as temporary and anything but its highest and best use (Smit et al. 1996).

The absence of official support for UA is often matched by a wide range of constraints. These include the contamination of actual and potential lots, restrictive zoning regulations, to say nothing of difficult access to land, funding sources, and other resources. If UA is not recognised as a highest-and-best use – or at least a reasonable and acceptable use – it is highly susceptible to land development pressures. In addition, the absence of agricultural activities in the city makes access to the everyday implements of gardening (water, fertiliser, materials, and tools) unnecessarily difficult.

A good understanding of the barriers to UA is important for the effective promotion of its practice. By clearly recognising the constraints, we can identify opportunities and priorities for action. First and foremost, it appears that greater awareness about UA is needed among the general public and municipal officials in particular. When the multiple benefits of UA become

acknowledged and valued, other barriers such as access to land and other resources can be systematically addressed and rendered innocuous.

Potential space for urban agriculture

Despite the constraints, there are many reasons to be optimistic. In the first instance, there is much vacant and underused land in cities, much of which can be transformed into productive green space. Categorical examples include abandoned lots and the paved courtyards found on the grounds of schools, hospitals, and other institutional facilities. Rooftops, especially those atop large industrial and institutional buildings, offer additional space for city gardening. In the second instance, UA is an extremely flexible activity. Intensive horticultural practices can produce large yields from small plots alongside buildings, on the periphery of courtyards, and on terraces and balconies. Innovative methods of gardening such as above-ground planters and hydroponics have been developed for use on contaminated land, paved surfaces, and rooftops; these increase flexibility and greatly reduce costs. Third, there is burgeoning interest in UA among city residents across Canada, including people who seek ways to get more involved in their communities, to grow their own fresh organic food, and/or to contribute to environmental sustainability in their own small way (Nourrir Montréal 2007b). In fact, it is widely reported that gardening is the favourite pastime of Canadians (Fairholm 1998).

1.8 People's motivations for practising urban agriculture

In contemporary cities, UA serves many different purposes in different contexts. For example, in many African countries, the major motivation is subsistence food production and additional income generation. There, "it is generally the poor who are cultivating in urban areas" (Nugent

2000, 75). Some low-income households in developed countries practise UA for similar reasons – to improve access to food and to complement household incomes. However, "the decision to farm and the level of effort spent on urban agriculture do not have a clear-cut relationship to income, wages, prices or employment opportunities" (Nugent 2000, 73). Other motivating factors underpin the decision of individuals to grow food in cities. Some enjoy the activity as a hobby and enjoy consuming the fruits of their labour; others strive to liberate themselves from the heavily industrialised and corporate-controlled agro-business; still others endeavour to cultivate their communities and green the urban environment through gardening. There are also those who run commercial-scale farming operations in urban and periurban areas for income generation (de Zeeuw, Guendel, et al. 1999).

Perhaps because UA has serves so many purposes for different people, it perseveres despite its informal status and indeed it has expanded in recent decades in response to the problems of the modern industrialised food system. UA has taken on new meanings, and its benefits are being rediscovered in a different light. "Urban agriculture is currently gaining local, national, and international momentum and is increasingly being seen as a viable planning strategy for sustainability at the local government level" (Holland Barrs 2007, 3). In cities – large and small, rich and poor, from the North to the South – urban agriculture is becoming more prominent and pushing its way onto the municipal policy agenda. Yet, there are still few examples of cities that have officially embraced urban agriculture and developed appropriate policies to regulate and promote the activity. As has already been suggested, an important reason is that UA continues to challenge popular perceptions about modern cities: "The prevailing eighteenth-century

Home garden in Montréal

philosophical view in Western Europe opposed natural to artificial, nature to civilisation, natural man to urban man" (Mougeot 1994, 7). A deeply-rooted psychological divide between the "urban" and the "natural" persists among researchers, policymakers, and the general public. Thus, before real and lasting progress can be achieved in urban agriculture, we must come to the understanding that the distinction of culture versus nature is unsubstantiated and inappropriate (Cronon 1996; Graham 1999).

A case has been made in the preceding pages that it is time to reconsider the relationship between agriculture and cities. Urban agriculture brings tremendous benefits to cities, and looming climate change makes it all-the-more imperative. The potential contribution of urban agriculture to climate change adaptation and mitigation efforts has yet to be widely recognised. It is essential, however, that local governments realise its value and champion its practice to help urban populations face the challenges brought on by climate change and ensure the vitality of cities. Some cities have already taken steps to integrate urban agriculture into a broader sustainable development agenda, although none have developed UA policies focused specifically on climate change. The following chapter looks at policy examples from these cities with the aim of drawing lessons for Montréal.

Chapter II

Examples of urban agriculture policies from other cities

As argued in Chapter I, urban agriculture is an essential climate change adaptation and mitigation strategy. Although local governments have yet to officially recognise it this light, some have acknowledged UA as a strategy towards sustainable development and have begun to develop policies and programs to promote its practice. This chapter will first highlight some examples from the developing world, and then zero in on three North American cities: Toronto, Ontario; Vancouver, British Columbia; and Seattle, Washington. Some notable policies from other North American cities are also discussed. The chapter concludes by drawing together lessons learned from the case studies.

2.1 The global context

Montréal is endowed with an expansive network of community gardens, widely recognised as one of the largest and best organised programs in North America (Kaethler 2006; Mougeot 1994). Yet the local government does not aspire to build on this asset, and does not even officially recognise its benefits for the city. Other cities have recently been much more active in adopting pro-UA policies and putting the food system onto municipal policy agendas. Various programs and initiatives in these cities may serve as examples and models from which Montréal could learn. The most comprehensive and elaborate policies on UA have been adopted in cities of the developing countries in the South. As the socioeconomic contexts in those cities are quite different from Montréal, however, more attention will be paid here to cities in developed countries. Nonetheless, the extensive experience that cities in the developing world have had with UA makes them instructive case studies, for they show the extent to which UA can make a

Box 2.1 Institutional mechanisms to support urban agriculture

- Incorporation of UA into official development plans
- Revision of bylaws and zoning codes to be more permissive and supportive of UA
- Leasing land to urban farmers under special agreements
- Granting permission to use undeveloped public land for a fixed period of time
- Establishment of ordinances to protect urban areas for agricultural production
- Development of permanent programs and agencies to regulate and promote UA
- Provision of credit and technical assistance
- Organisation of urban farmers into legal associations

city more self-sufficient in food production while also demonstrating the advantages of adopting pro-UA municipal planning policies.

In developing cities, UA was never phased out to the same extent as in North America, although it was officially prohibited in most jurisdictions. In recent decades, UA has increasingly become a necessary survival strategy for many households in response to rapid population growth, unemployment, and economic hardship. For instance, in Dar-es-Salaam (Tanzania), UA is the second largest employer, accounting for 20% of all jobs. Almost a quarter (23%) of the urban area is used for crop production, yielding 100,000 t of food crops annually (Mougeot 1994). Sixty percent of the milk and 90% of the vegetables consumed in Dar-es-Salaam are produced in the city (Nugent 2000). Other developing cities are documenting similar extents of UA. For example, Dakar (Senegal) is from 65% to 70% self-reliant in vegetables and poultry; Shanghai (China) produces 60% of the vegetables, all of the milk, 90% of the eggs, and 50% of the pork and poultry consumed there. In Sofia (Bulgaria), local food production accounts for 48% of milk, 53% of potatoes, and 50% of vegetables consumed in the urban area, and in Hanoi (Vietnam), 80% of vegetables, 50% of pork, poultry, and freshwater fish, and 40% of eggs originate from urban and periurban areas (ETC - Urban Agriculture Programme 2003; Nugent 2000).

In response to the widespread practice of UA, many cities have officially acknowledged urban food production and created formal support mechanisms to better manage the activity (Box 2.1). Experience demonstrates that formal recognition and support of UA is beneficial for both urban farmers and municipalities. Farmers benefit from a secure access to land, technical support, and

Box 2.2 Actions by the City of Havana to encourage UA

- Organises gardening associations and allows them to use state land free of charge;
- Maintains a staff of 70 agricultural extension agents who provide support to the growers;
- Facilitates the supply of high-quality seeds, natural fertilisers and bio-pesticides in small quantities to urban farmers through a network of local stores;
- Supports markets where gardeners can sell their surplus produce;
- Runs 83 sapling nurseries for distribution of fruit trees;
- Encourages the production of eggs, chickens, and rabbits within the city;

formal information and distribution networks. Municipalities benefit because they can manage the activity and prevent potential health and environmental hazards. In addition, the recognition of UA creates a formal economic sector, with benefits for the population and the municipality.

Havana, Cuba, has perhaps one of the most comprehensive and supportive policy frameworks on UA. The widespread practice of agriculture in Cuban cities arose out of necessity, when the collapse of the Communist Bloc in the late 1980s significantly curtailed foreign trade and aid from the Soviet Union. In response to acute food shortages, the Cuban Ministry of Agriculture began to promote urban food production, and the City of Havana implemented a comprehensive urban food production plan (Toronto Food Policy Council 1999; Moskow 1999). Both the state and municipal governments have adopted policies and programs to support urban farmers and gardeners. The Cuban government initiated and continued to support UA by creating the Urban Agriculture Office (UAO) of Havana and protecting urban areas under agricultural production through 19 ministerial resolutions (Mougeot 1999). The City of Havana in turn has taken more concrete actions to promote urban food production (Box 2.2).

As a result of these policies, 42% of the land area in the metropolitan region of Havana is now devoted to food production (Toronto Food Policy Council 1999); by some estimates, there are more than 26,000 gardens in the city (Moskow 1999). On these nearly 300 km^2 of urban farms and gardens, Havana produces over 100,000 t of foodstuffs per year, making it 50% self-sufficient in vegetables (Brown and Carter 2003; ETC - Urban Agriculture Programme 2003).

Box 2.2 Cont.

- Supports 450 larger commercial production units employing 10 to 12 people each; and
- Establishes small-scale decentralised composting facilities for the production of organic fertiliser.

Directly and indirectly, the UA sector employs 117,000 people – about five per cent of the city's population (ETC - Urban Agriculture Programme 2003).

Although cities of the developing world face a different set of realities from those of their North American counterparts, we can nonetheless look to them for examples of policies. Perhaps the most significant lessons that can be drawn from developing cities are that urban areas can be much more self-sufficient in food, and that there are concrete benefits from adopting pro-UA policies. Although UA is not nearly as extensive in the countries of the North, some cities have begun to put food policy on their agendas and are developing policies and programs to support and encourage UA. No city has yet to develop a comprehensive policy framework on UA, but some have made notable progress. Three North American cities in particular – Toronto, Vancouver, and Seattle – have initiated processes to formally integrate UA into their municipal agendas and promote its practice. These cities are broadly comparable to Montréal in terms of socioeconomic and political contexts, and thus offer excellent examples of the types of policies and processes that could be adopted here.

2.2 Toronto, Ontario

Like most cities, Toronto has largely ignored UA and the food system until recently. Since the creation of the Toronto Food Policy Council (TFPC) in 1991, however, Toronto has been making efforts to bring agriculture back into the city. The TFPC was formed by the City of Toronto as a sub-committee of the Toronto Board of Health. Its 21 members include city councillors and volunteer representatives from consumer, business, farm, labour, multicultural, anti-hunger

advocacy, faith, and community development groups. The TFPC has three full-time permanent staff members and a modest operating budget of $200,000 provided by the City. Of particular note about the TFPC is its high level of independence. Although it does not have the power to pass laws and enforce policies, it has been very successful in promoting food issues in the municipal government through its research, awareness campaigns, and advocacy for policy change. “The success to which the TFPC has spearheaded innovative food-access initiatives, supported a diversity of community organisation, contributed to network development, and put food security on the political agenda makes it a model for municipalities across North America” (Fairholm 1998, 51). Since 1991, the TFPC has been a driver of change in Toronto, contributing to a number of notable accomplishments.

For example, it helped to establish an Interdepartmental Working Group on Urban Food Production, linking the Departments of Housing, Planning and Development, City Property, Buildings and Inspection, Public Health, Parks and Recreation, and Public Works and the Environment. “This group assessed the capacities and expertise of various city government units and issued recommendations for these to support food production in the city” (Mougeot 1994, 12). The City Council passed these recommendations in December 1993. The Council also helps to create programs and initiatives by bringing together various stakeholders. One example is Field to Table, a local food distribution system that makes fresh local produce available and affordable to low-income communities. A local non-profit organisation called Food Share now operates this program (Biehler et al. 1999). Since it conception, the TFPC has produced a steady stream of discussion papers on food systems policy. As part of the Toronto Food Policy Council

Box 2.3 Actions by the City of Toronto to develop community gardens

- Identifies and develops potential community garden sites;
- Develops partnerships between Parks and Recreation and community residents, seniors, faith groups, cooperative housing, hospitals, schools, daycare centres, and other community groups, for the establishment of community gardens;
- Provides horticultural and maintenance training to the various community groups and partners (City of Toronto 2008);
- Provides start-up funding of $5,000 to $8,000 for new community gardens, and supplies water at no cost (Kaethler 2006).

Submission to the Toronto Official Plan, published in 2000, the TFPC issued a detailed report on UA, making a strong argument for urban food production and specific recommendations for the City. This document will be instrumental for developing a strategic UA policy in Toronto in the coming years (Roberts 2001).

There are several parallel initiatives worth noting in Toronto. The City created the Community Gardens Program in 1997 with the explicit aim of increasing the number of community gardens across Toronto. This program supports the creation of new gardens in several ways (Box 2.3). As a result, the number of community gardens has increased from 50 to 122 in the first 10 years since the creation of the program and now supports about 4500 participants; six to 10 gardens continue to be added every year (Kaethler 2006). In addition, in June 2007, the City Council approved two new composting facilities, which together will be able to process 110,000 t of organic material a year. The City has plans to further expand its organic material diversion program to meet its goal of diverting 70% of municipal waste from landfill sites by 2010.

The City of Toronto has been active on the policy front, as well. In December 1999, it formed the Food and Hunger Action Committee to study food security in Toronto; in May 2000, this Committee published a report – Planting the Seeds: The Phase I Report of the Food and Hunger Action Committee – documenting the state of food security and making recommendations to reduce hunger, improve nutritional health, and support food-based initiatives with benefits for the economy, environment and quality of life. Also in May 2000, the Toronto City Council adopted a Food Charter to promote food security. The Food Charter squarely recognises food as

an important issue, and explicitly states that the protection of agricultural lands and the promotion of UA is one of its primary goals. The Charter also supports the creation of rooftop gardens. Furthermore, the Toronto Official Plan makes numerous references to food security and urban food production. It recognises community gardens as a vital part of mixed use communities and aims to increase their numbers. Among its other goals is to seek to protect agricultural lands, to increase the number of rooftop gardens, and to implement the Food and Hunger Action Plan to promote food security.

2.3 Vancouver, British Columbia

Vancouver has taken up an aggressive mission not only to bring agriculture into the city, but to make it an integral part of its sustainable development plan. In response to a decade of community organising around food policy issues, the City Council passed a motion in support of a just and sustainable food system for the City of Vancouver in 2003 (Kaethler 2006). Since then, much progress has been made. The process began with an eight-month public consultation process and food system assessment. Later in 2003, the City Council approved the Action Plan for Creating a Just and Sustainable Food System for the City of Vancouver (Food Action Plan), and, as part of that Plan, elected the 18-member multi-sectoral Vancouver Food Policy Council (VFPC). The VFPC was modeled on that of Toronto: it has two permanent staff as well as engaging volunteer members from various sectors of the food system, including nutritionists, food banks, farmers, the Vancouver School Board, de Department of Public Health, the Chinese Cultural Centre, representatives of the food industry, the provincial Ministry of Agriculture,

managers of non-profit organisations, and academics engaged in the food system, among others (Direction de santé publique 2004; Mendes 2006).

Vancouver's Food Action Plan is a comprehensive document that brings the food system into the sustainability discourse. It sets out goals, objectives and implementation measures for "the development of a just and sustainable food system for the City of Vancouver, with a strategic focus on areas where the City has the capacity to act" (Mendes 2003, 6). The Plan is based on two core strategies: to promote multi-actor involvement in policy making and implementation and to integrate food policy into a broader sustainable development agenda: "From the outset, the Food Action Plan acknowledged that some of the resources and policy tools necessary to address food system issues fall outside of the jurisdiction of the municipality. As such, the development of partnerships with other agencies has been instrumental to the process" (Mendes 2006, 52). Among the key partners are the Vancouver School Board, the Vancouver Park Board, Vancouver Coastal Health, community organisations, and local universities. The second key policy objective is to integrate UA into the broader sustainable development agenda (Mendes 2006). The formal recognition that food policy issues are an integral part of Vancouver's longstanding commitment to sustainability is a key element of the City's efforts to improve the food system for, "like sustainability, urban agriculture and food policy are crosscutting issues often involving a wide range of departments for effective implementation and monitoring" (Mendes 2006, 52). Being part of a greater sustainable development framework allows food policy initiatives to take advantage of already existing policies, mandates, and inter-departmental collaboration efforts on sustainability Notably, the Food Action Plan makes a link between

Grandview Woodlands School, Vancouver
Source: Holland Barrs 2002

climate change and agriculture, suggesting that UA is a vital strategy to reduce the city's greenhouse gas emissions and to address climate change (Kaethler 2006; Mendes 2003).

Among the concrete actions planned to promote urban agriculture in Vancouver are increasing the numbers of rooftop and community gardens (2010 gardens for the 2010 Olympics), creating farmers markets, opening a local food processing and distribution facility, and facilitating urban beekeeping, fruit trees, and edible landscaping. Vancouver is also taking the lead in wastewater treatment for use in UA. The "Solar Aquatic" sewage-treatment system that has been introduced "duplicates the natural purifying processes of meadows and wetlands, utilising bacteria, algae, plants and aquatic animals to produce treated wastewater ready for use to irrigate crops" (Deelstra and Girardet 2000, 56).

Solar aquatic wastewater treatment facility
Source: Playbook for Green Buildings + Neighbourhoods

The most groundbreaking policy initiative in Vancouver is the incorporation of urban agriculture as a central component of the Southeast False Creek Official Development Plan. This district is being planned and built out as a model "sustainable urban neighbourhood" (City of Vancouver 2007), and as part of the process, the City commissioned two studies, delivered in 2002 and 2007, to identify the opportunities for UA in SEFC. The detailed reports provide practical design solutions, technical considerations, and management strategies for integrating UA into a high-density urban neighbourhood such as SEFC (Holland Barrs 2007). Drawing on the reports' recommendations, the Official Development Plan sets goals to create a community demonstration garden, set up a farmers market, encourage building designs that would be able to accommodate green roofs for urban agriculture, and to provide for on-site composting and rain

water collection. With this development, the City of Vancouver has clearly demonstrated its commitment to food systems and urban agriculture as a central component of urban health and sustainability. SEFC has become a laboratory for integrating UA into high-density developments, and should serve as a useful model for other municipalities.

2.4 Seattle, Washington

P-Patch garden in Seattle
Source: Seattle Times

As was the case in Montréal, community gardening in Seattle started in the 1970s. Currently, Seattle has some 60 community gardens, run under the Department of Neighbourhoods P-Patch garden program. However, recent support for UA has been much stronger in Seattle than in Montréal in several ways. First, the Seattle Comprehensive Plan has formally recognised UA as an important land use since 1995, and strongly supports its expansion. The Plan seeks to "promote inter-agency and intergovernmental cooperation to expand community gardening opportunities, and include P-Patch community gardening among priorities for use of City surplus property" (City of Seattle 2005, 1.27). It also sets a fixed objective of increasing the number of community gardens to one for every 2,500 households (City of Seattle 2005, 8.82). Seattle's zoning regulations are also very supportive of UA. Community gardens are considered a recreational use of open space, and thus are allowed in all zoning districts as long as they do not disrupt existing activities. No permits are required to practise UA. The City also supports small-scale animal farming, allowing "up to three domestic fowl per lot, four beehives, and three small animals, including one pot-belly pig" (Kaethler 2006, 23). The formal recognition and support of UA as a viable and valuable land use has proven to be important is several respects: it "stabilised

access to plots, solidified irregular support from the Parks Department and other agencies, and created a shared reference point for city officials and citizens" (Kaethler 2006, 24).

In addition to community gardening, Seattle has shown strong and continuous interest in preserving periurban agricultural land. Through constant efforts over the last quarter century, the City, in partnership with the County, has succeeded in preserving local farms in the Puget Sound area. Specialty farming operations now thrive on small plots and supply the city with a great variety of fresh, often organic, produce (Toronto Food Policy Council 1999). The City of Seattle is currently working with King County and P-Patch to establish a formal food policy council to address food system concerns.

2.5 Other examples of pro-UA policies

Portland, Oregon

Portland's zoning code is highly permissive of UA. Agricultural uses are considered a Primary Use in the Open Space Zone, in the Employment and Industrial Zones, and in Single-Dwelling Residential Zones. Agriculture is a conditional use in three of the eight different kinds of Commercial Zones, and is disallowed only in Multi-Dwelling Residential Zones (Lachance 2004). The practice of UA is controlled through the issuance of permits.

Victoria, British Columbia

In 2007, the City of Victoria passed an Urban Agriculture Resolution, recognising the environmental, economic, health, and social benefits of urban food production and committing to

promote it in the future. The heart of the resolution reads: "The City of Victoria supports in principle the concept of urban agriculture as a valuable community resource and will work to collaborate with the community, neighbouring municipalities and Capital Region District to support and encourage urban agriculture where possible" (City of Victoria 2007).

Berkeley, California

Contrary to most Food Policy Councils, membership to the Berkeley Food Policy Council (BFPC) is open to the public, and every participant acquires voting rights after attending two meetings. The City Council and the municipal department of public health recognise the importance of working with the autonomous BFPC and have developed an active partnership with the body. Recently, the City Council passed the *Food and Nutrition Policy*, by which it has committed to using its purchasing power to favour local producers (Direction de santé publique 2004). This policy was developed by the BFPC with input from the Offices of the City Manager, the City Attorney, and Economic Development and the Departments of Finance, Housing, Parks, and Recreation and Waterfront (Caton Campbell 2004).

Québec City, Québec

Under the *Loi de protection du territoire et des activités agricoles*, the City of Québec protects 23% of its territory (12,379 ha) as a permanent agricultural zone. The municipal council has put in place the *Table de concertation agricole de la Ville de Québec*, with the goals of encouraging local production, establishing public markets in various city districts, and promoting an urban form that integrates agriculture.

Sydney, Australia

The Sydney region currently produces 85% of the mushrooms, 70% of the tomatoes, and 95% of the spring onions comprising the total production of the state of New South Wales (Toronto Food Policy Council 1999). Recognising the economic benefits of urban and periurban food production, the New South Wales Ministry of Agriculture adopted a Strategic Plan for Sustainable Agriculture in the Sydney Region in 1998. This was the result of a five-year community consultation process; it recognises the benefits of local food production and identifies key issues to ensure the development of sustainable agriculture. The Strategic Plan has engendered inter-sectorial co-operation among the Ministries of Health, Agriculture, Regional Development, Transport and Tourism, Education, Environment Protection, Land and Water Conservation (Toronto Food Policy Council 1999).

2.6 Lessons for policy development

It is clear that attitudes on UA are evolving in cities across Canada and around the world. In the last two decades, many municipalities have recognised UA as a strategy to protect the environment, promote social and economic development, and enhance food security and public health. In response, they have initiated processes to integrate agriculture into land use planning and municipal policy agendas. Despite the intimate link between agriculture and climate change, however, UA has not yet come to be widely seen as a strategy to address climate change. Nonetheless, the policy tools for promoting UA implemented in other cities are useful points of departure for developing UA as a climate change adaptation strategy in Montréal. An analysis of

the case studies above suggests a number of vital strategies and implementation processes for supporting UA in the interest of climate change adaptation and mitigation.

Food policy councils

FPCs are advisory bodies within municipal governments that focus on the food system. In recent decades, they have become increasingly popular in North America. The first one was established in the Knoxville Tennessee in 1982. Within just over two decades, the number of FPCs in North America reached 27 (Caton Campbell 2004). Most FPCs are composed of about 20 volunteer members, who are elected or appointed by the municipal council. They typically include farmers, food processors, distributors, retailers, institutional purchasers, school food-service staff, nutritionists and dieticians, anti-hunger advocates, various non-profit organisations, religious groups, academic researchers, representatives from local, regional, and national government agencies (e.g., health, human services, food and nutrition, social services, parks, agriculture, education, transportation, community development, economic development, and planning), and members of the general citizenry (Caton Campbell 2004). FPCs receive an operating budget from city councils, and usually have at least one permanent full-time staff member. In some instances, staff from other participating agencies consecrate part of their time to the FPC. Especially if given a large degree of independence, FPCs can be very effective at identifying gaps in the food system through research and public consultations, bringing together interested stakeholders, initiating programs and education campaigns, and identifying policy priorities.

Formal recognition of UA in official plans and other municipal policies

A number of cities have officially recognised UA as a viable and valuable land use through their official development plans, strategic plans, or resolutions. These documents acknowledge the environmental, social, health, and economic benefits of local food production, and commit in principle to promote UA through the creation of community gardens, establishment of public markets, protection of agricultural land, and promotion of local produce through municipal purchasing power. There are nonetheless several shortcomings that should be highlighted. Most attention is focused on community gardening, paying less attention to commercial food production, local food processing, and distribution networks. For the most part, a comprehensive policy framework on UA is still a distant reality. In addition, very few of these documents commit to specific targets. Seattle's target for increasing the number of community gardens is an exception rather than the rule. Finally, the link between agriculture and climate change continues to fly beneath the radar of municipal policy. Many official plans do not talk about climate change, and those that do fail to recognise UA as a potential strategy to address the issue.

Favourable zoning

Some municipalities have explicitly recognised agriculture as a legitimate land use in commercial, industrial, and residential zones. Some, such as Seattle and Portland, expand the definition of UA to include small-scale livestock production. Zoning agriculture into other land-use categories as a compatible use challenges the idea that agriculture must be confined to rural areas, gives flexibility for using derelict or underused lots for small-scale crop cultivation, and facilitates access to land, which is currently one of the key challenges for UA. Along with

tolerant zoning codes, municipalities often require urban farmers and gardeners to acquire permits. This policy allows municipalities to have control over agricultural activities and avoid potential environmental and public health hazards.

Inter-departmental collaboration

As UA touches on so many issues, municipal administrations that have begun to develop UA policies have recognised the importance of horizontal collaboration among numerous city departments. Particularly important players are departments of planning, environment, health, parks and recreation, economic development, and social development. Currently, this collaboration mainly occurs through food policy councils, but can also be led by one municipal agency or department given primary responsibility for UA.

Municipal partnerships with other stakeholders

Urban farmers and gardeners, food processors and retailers, school boards, non-profit and community organisations, universities, regional, provincial, and national government agencies are among the key stakeholders that have been involved in UA planning and policy development. These actors keenly perceive the challenges and opportunities for urban food production, and are invaluable in helping to develop a comprehensive and effective policy framework.

Formal protection of agricultural land

Many cities, including Portland, Seattle, Vancouver, Québec, and Montréal, have established permanent agricultural zones, where farming is protected through legislation as the primary and

best use of the land. Continuous protection of these lands against development pressures is necessary to maintain the remaining urban and periurban arable land for agricultural use. In addition, efforts to maintain viable small-scale organic faming operations are necessary to ensure that these protected lands are in fact used for agricultural activities.

Dedicated municipal staff

Although no municipality has yet to create a Department of Food, several have dedicated staff people working to develop ties among municipal departments, to establish partnerships with other agencies and organisations, and to initiate programs to encourage local food production while also raising awareness. These employees may be the staff of a food policy council or they may be hired by other city departments and required to dedicate part of their time to food policy issues. Not surprisingly, experience from Knoxville shows that a FPC with part-time staff from various departments lacks continuity and is less effective than one where there is at least one permanent full-time staff person (Biehler et al.1999).

The preceding paragraphs examined a number of case studies where local governments have developed and implemented UA policies and programs. These case studies can serve as practical examples for Montréal; yet, policy precedents from other cities cannot be automatically translated to Montréal, as it has it own particular social, political, and economic contexts. Thus, before proceeding to make specific recommendations, a detailed analysis of the state of UA in Montréal is warranted; this is the subject of the next chapter.

Chapter III

Mapping urban agriculture in Montréal

Urban agriculture in Montréal is well developed in comparison with other North American cities, yet Montréal is lagging behind in terms of policy. Official attitudes are ambivalent, and a comprehensive policy framework on UA still seems a distant prospect. Nonetheless, the prospects are encouraging: official attitudes on UA are showing signs of change, and the positive attitudes among the general population create a receptive environment for the development of UA. This chapter maps numerous aspects of urban agriculture in Montréal. A broad definition of mapping is assumed, which includes not only physical spaces, but also actors, policies, and perceptions. The chapter is divided into four sections: the first describes the physical spaces where UA is practised in Montréal; the second discusses the roles of the principal actors involved in UA; the third assesses the official policy environment; and the fourth examines popular attitudes and perceptions towards UA.

3.1 Spaces of urban agriculture

Urban agriculture in Montréal has a large and well-established presence. It includes a permanent agricultural zone, productive gardens, public markets, and community-supported agriculture. Gardening is practised in community, collective, and residential gardens. Rooftop gardening is also becoming increasingly widespread among collective garden associations and private residents alike. Map 1 shows the locations of agricultural activities on the island of Montréal, including the permanent agriculture zone, community and collective gardens, and public markets.

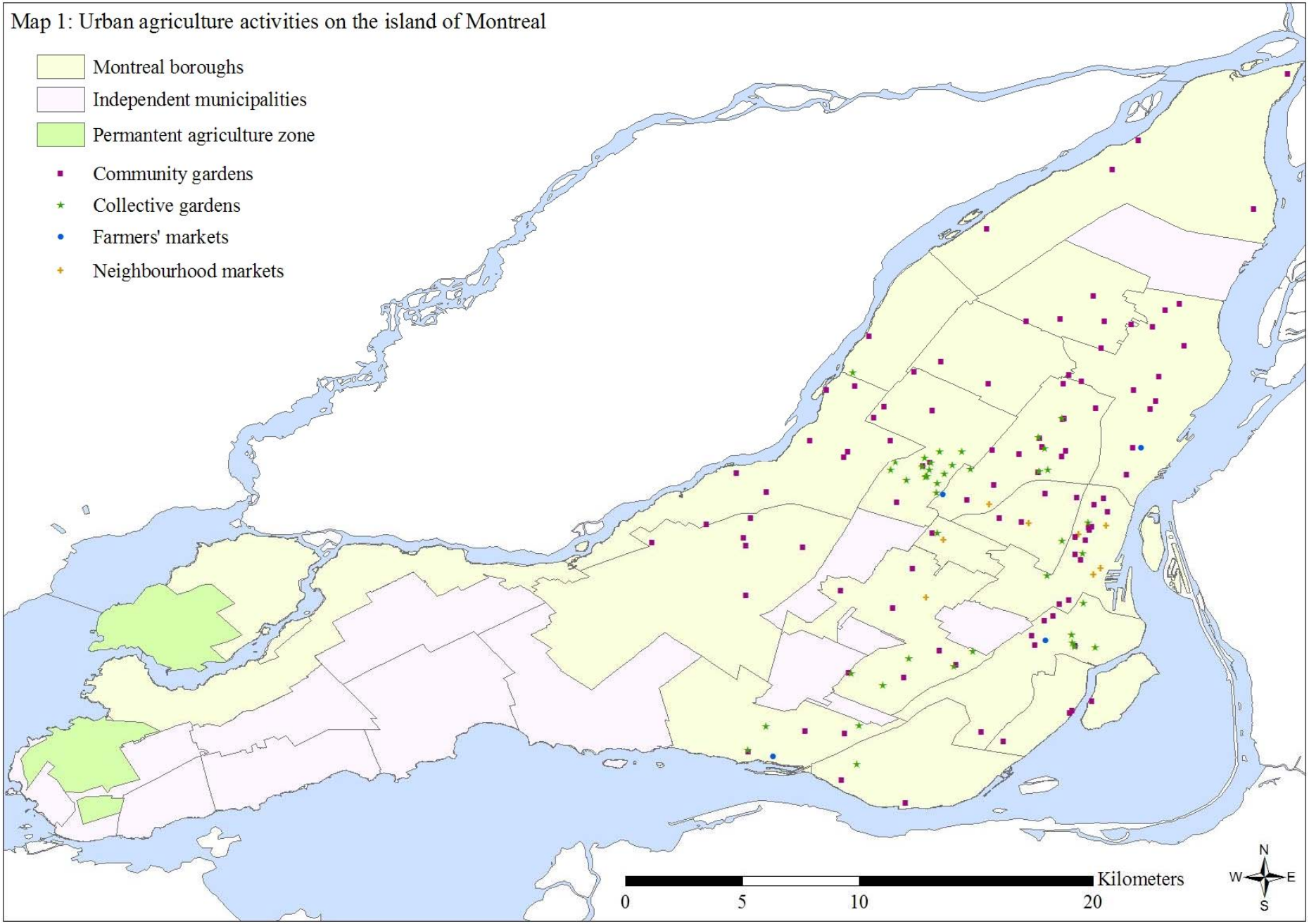

Map 1: Urban agriculture activities on the island of Montreal
Montreal boroughs
Independent municipalities
Permantent agriculture zone
Community gardens
Collective gardens
Farmers' markets
Neighbourhood markets
Kilometers
0
5
10
20
N
W
E
S

Figure 3.1 Communauté métropolitaine de Montréal
Source: le grand Montréal fait sa marque

Permanent Agricultural Zone

The only place where agricultural activities are explicitly permitted under the Montréal zoning code is in the areas comprising the Permanent Agricultural Zone (PAZ), totalling approximately 2060 ha (about four per cent of the total area of the island of Montréal). This land is currently used for an agricultural park, an experimental farm run by McGill University, an eco-museum, and an arboretum. However, non-agricultural uses such as golf courses also occupy the PAZ, and farming operations are in fact not very extensive and lack vitality (Ville de Montréal 2005, 127). Because of its relatively small size, its isolation in the western part of the island, and its lack of agricultural vitality, the PAZ is not highly significant either in terms of food production or climate change adaptation and mitigation. At the regional scale, periurban agriculture is much more significant than on the island of Montréal. Fifty-eight percent of the territory of the Communauté métropolitaine de Montréal (Figure 3.1) is a permanent agricultural zone, of which 73% is in effect occupied by agricultural activities; more than two thirds of the crops produced in Québec are cultivated in this region (Direction de santé publique 2004).

Community gardens

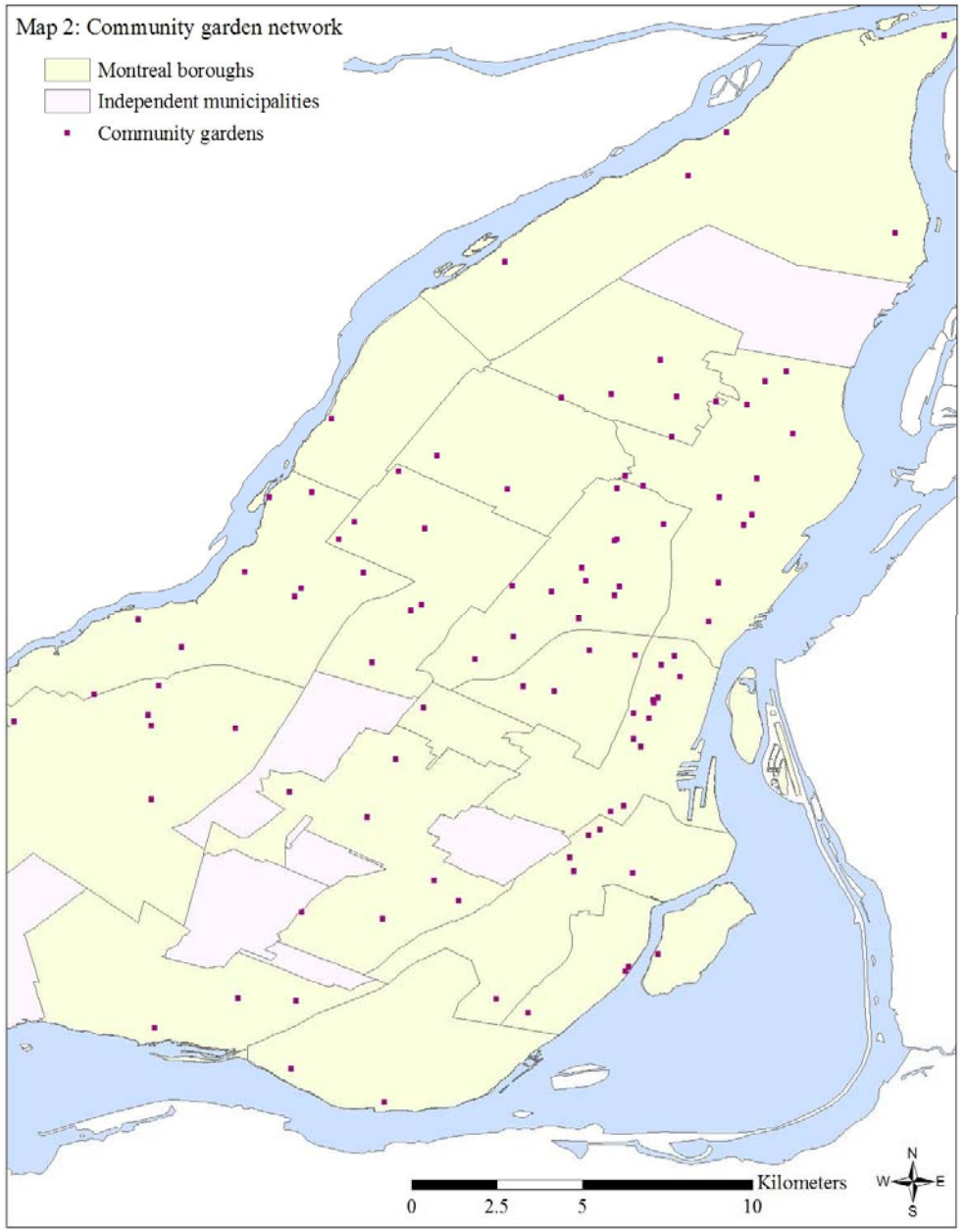
Community gardens consist of parcels measuring 18 m^2. They are distributed to individual garden members, who are individually responsible for cultivating their garden plots but who then fully harvest whatever they produce. Members are provided with water and gardening implements; some gardens also have on-site composting. Six horticultural animators offer technical support and advice, visiting each garden on a rotating basis about once every two weeks. Gardening committees, elected by the member gardeners, supervise daily activities in the

garden sites and manage the distribution of plots. The cost of participation includes a yearly fee of $10 to the City, plus $2 to $20 for the maintenance and purchase of equipment.

All told, Montréal has the second largest community garden program in North America, after New York City (Duchemin 2008); the municipal organisation of community gardens began in 1975. Administered by the Department of Culture, Sports, Leisure and Social Development, the program now manages 76 gardens, totalling 6400 plots (Reid 2006). The number of plots in each garden ranges from 11 to 250. It is estimated that they serve about 10,000 people, with a level of occupancy near 100% in all gardens. Waiting lists of several years are not uncommon. Another 24 community gardens are run by senior citizens' homes, recreation centres, hospitals, and horticultural societies. In total, these 100 gardens cover an area of 26 ha comprising about 7900 plots (Maps 2 and 4). To ensure that the gardens are used productively, planting guidelines stipulate that flowers and herbs cannot take up more than 25% of the garden area. The garden rules also promote biodiversity by requiring that a given vegetable variety take up no more than 25% of the garden area, and by stipulating that at least five different vegetable varieties be grown in each garden. Only ecologically-benign growing methods and environmentally-friendly techniques for bug control, plant disease, and weed infestation are permitted. Gardeners are strictly prohibited from using any kind of synthetic fertilisers, pesticides, or herbicides.

Victoria community garden

Montréal community garden

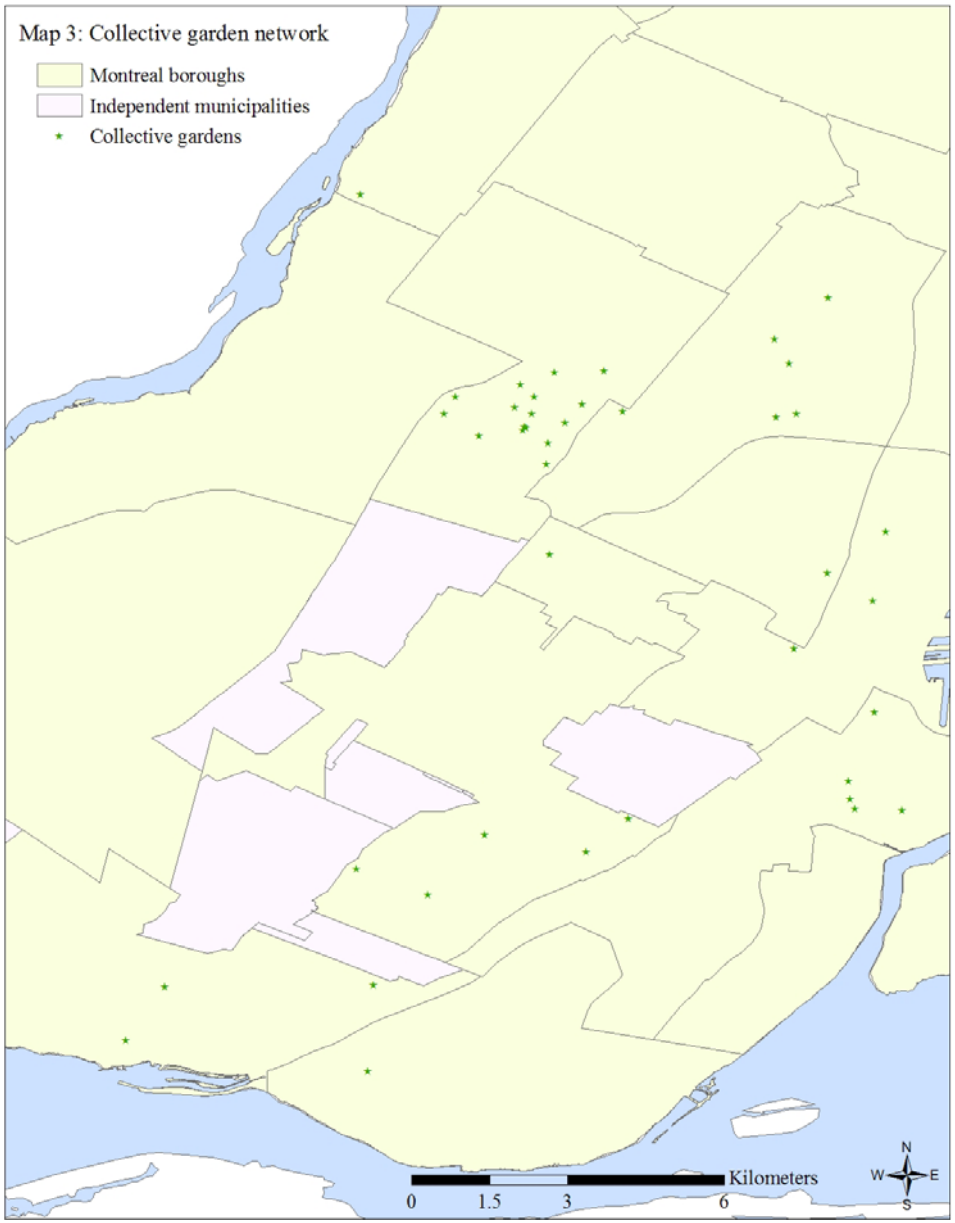


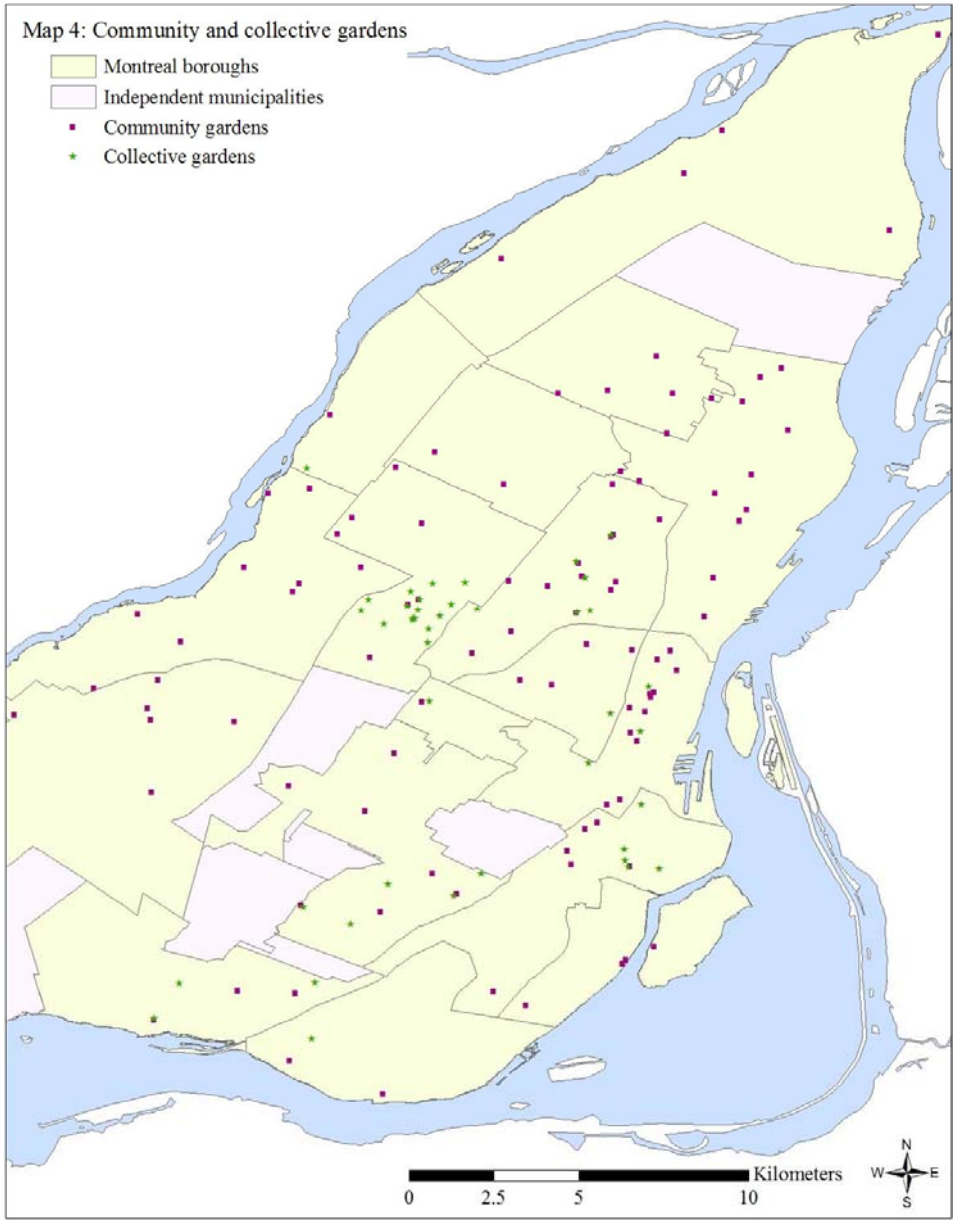
According to a survey of community gardeners (Reid 2006), there are three reasons for participation. Forty per cent say that their primary reason for gardening is food production and the same proportion name recreation, while 20% report other reasons such as social networking or concern for the environment. Duchemin (2008) believes that increasingly, gardening is practised less for recreation and more for food production, especially among low-income participants, who comprise 50% to 60% of the gardens' membership (Reid 2006). This belief is supported by a recent case: when several gardens were closed for food production but remained open for growing flowers, most gardeners abandoned their plots altogether, showing that growing flowers was not worthwhile for them (Duchemin 2008).

Collective gardens

Collective garden
Source: Action Communiterre

Unlike community gardens, collective gardens are not subdivided into individual parcels, but instead cultivated by a group of people who work together and share tasks and harvests, coming together a number of times per week to tend the garden. A horticultural animator provides guidance and technical support to the gardeners, while collective garden associations supply all of the materials and equipment necessary for gardening. Aside from a largely symbolic membership fee, collective gardening is free for participants. Collective gardens have an explicit mission to enhance food security and the sustainability of agriculture and the food system. Ecologically-benign growing methods and social interaction and collaboration are hallmarks of this approach.


Map 3: Collective garden network
Montreal boroughs
Independent municipalities
Collective gardens
Kilometers
0
1.5
3
6
N
W
E
S


Map 4: Community and collective gardens
Montreal boroughs
Independent municipalities
Community gardens
Collective gardens
Kilometers
0
2.5
5
10
N
W
E
S

Box 3.1 Collective garden associations on the island on Montréal

- Alternatives/Santropol Rooftop Garden Project
- Action Communiterre
- Action concertée pour la sécurité alimentaire
- Bouffe Action Rosemont
- Concert'Action Lachine
- Maison de Quartier Villeray
- Nutri-Centre LaSalle
- Comité de revitalisation urbaine intégrée de Saint-Pierre
- Dans la rue

Since 1997, various community organisations have independently set up collective gardens. In 2007, a critical number of the collective garden associations in the Province of Québec organised into the Regroupement des Jardins Collectifs du Québec. On the island of Montréal, there are at least nine collective garden associations (Box 3.1), which run 42 collective gardens (Maps 3 and 4). Together, they cover an area of approximately one hectare and have nearly 2,000 participants. The collective gardens are most often located on the grounds or rooftops of schools, universities, community centres, social housing projects, and sometimes on private property. To gain access to land, collective garden associations make arrangements on an ad-hoc basis with their hosts.

Private residential gardens

As is the case in most Canadian cities, Montréal has a rich culture of growing vegetables in private residential gardens. It is not uncommon to see fruits and vegetables in front and back yards, on balconies, and, more recently, on the rooftops of private residences. Gardening has always been an important part of Canadian cities, as evidenced, for example, in the Royal Ontario Museum exhibition on the history and culture of gardening in Toronto, presented in 2000 (ROM 2000). Unfortunately, there is neither a reliable inventory of how many households cultivate gardens on their private property, nor any record of how much food is produced in this way. However, it seems that gardening is extremely popular, and may even be gaining strength due to the efforts of some community organisations to promote the activity. For instance, the Rooftop Garden Project and Milton-Park Urban Ecology Centre together sell ready-to-grow toolkits (Figure 3.2) for gardening on rooftops, balconies, and terraces. In 2007 – the second year of the program – 371 toolkits were sold, 273 of them to groups and 96 to individuals, an increase

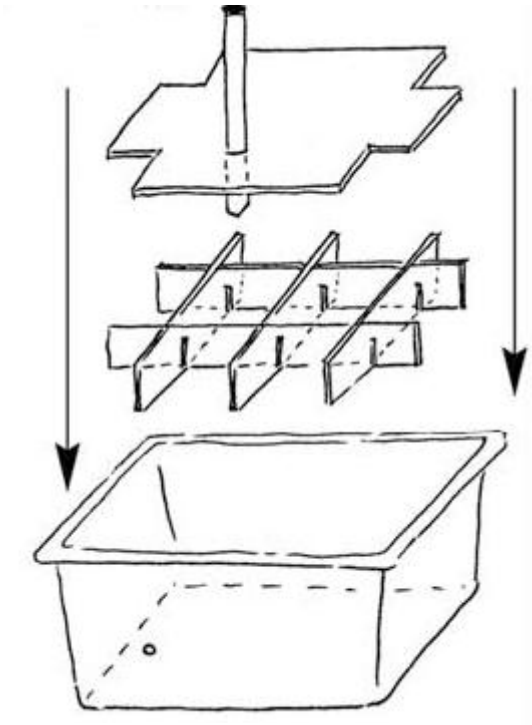


Figure 3.2 Growing toolkit
Source: The Rooftop Garden Project

from about 300 sold in 2006 (Ayalon 2008). In addition, these organisations provide information and assistance to novice gardeners.

LocoLocal is another new initiative. Started in 2007, the group offers people to grow vegetables on their property through two arrangements. The first option involves property owners paying LocoLocal to tend their garden, in which case they keep most of the harvest except for a small part donated to the Santropol Roulant meals-on-wheels program. The second option involves property owners providing the use of their space to LocoLocal free of charge, which uses it to grow food for sale and for donation to local organisations; in this case the property owners are given a small portion of the harvest as a token of thanks (Semenak 2007). In 2007, LocoLocal had five volunteer coordinators and 50 participants who together cultivated several gardens, including a rooftop garden on the UQÀM campus, a rooftop garden on a private residential building, and a neighbourhood alleyway garden (Ayalon 2008).

Public markets

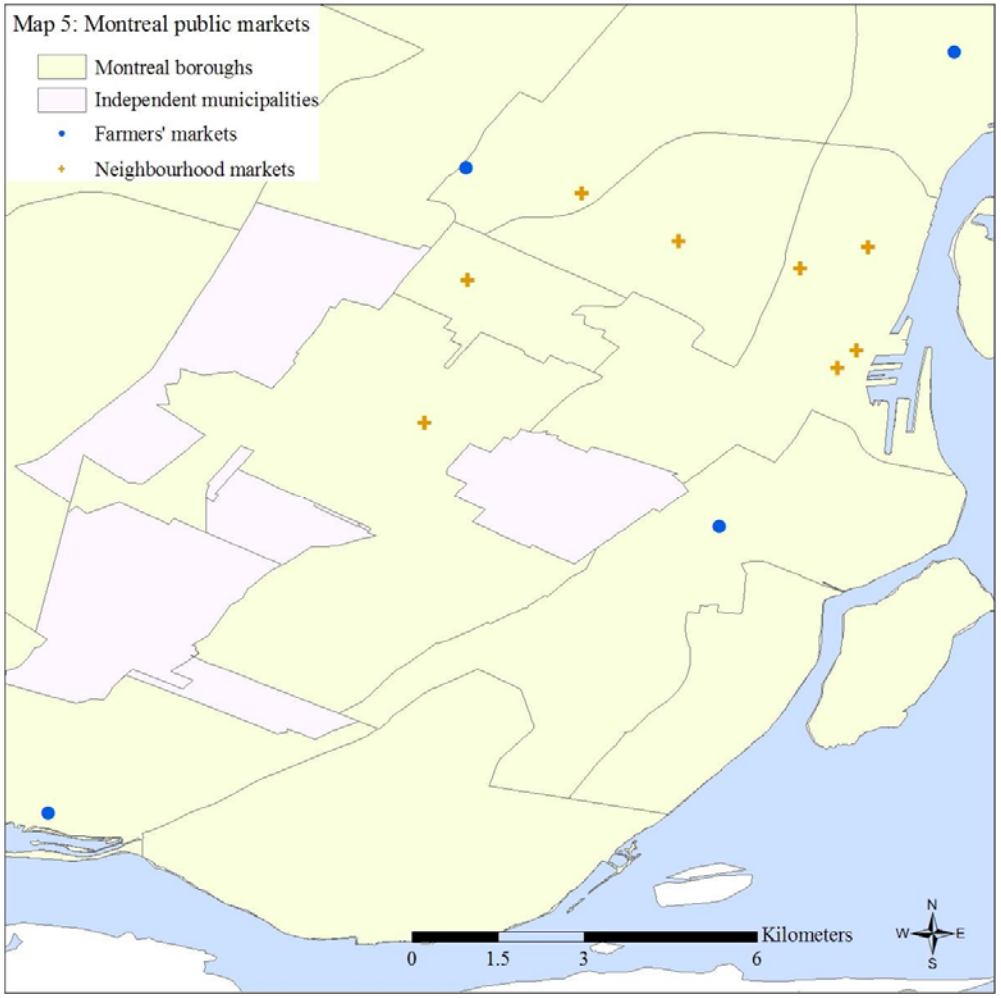
In addition to various spaces of food production, Montréal has a number of markets where fresh local produce is sold (Map 5). Public markets are an integral part of UA as a climate change adaptation strategy because they provide local producers with an alternative to the centralised and largely corporate food-distribution system, thus helping to ensure the viability of small-scale local farms. These institutions also help to encourage local food production, supporting food security, and in obvious ways minimising the need to transport foods over long distances. Montréal has four large farmers' markets: the Atwater, Jean-Talon, Lachine, and Maisonneuve

Marché Jean-Talon
Source: Project for Public Spaces

Markets. There are also a number of smaller neighbourhood markets, some of which are seasonal (Box 3.2). However, the mapping of farmers' and neighbourhood markets in Montréal reveals that they are highly concentrated in the central neighbourhoods of the city and that most boroughs have no public markets at all (Maps 1 and 5).

Box 3.2 Neighbourhood markets

- Mont-Royal Market
- Jean-Brillant Neighbourhood Market
- Place Jacques Quartier Neighbourhood Market
- Rosemont Neighbourhood Market
- Old Montréal Flower Market
- Saint-Jacques Market
- Papineau Market
- Outremont Organic Market



Box 3.3 Benefits of community supported agriculture

- Allows small-scale farmers to have secure access to a local market, thus reducing financial risk;
- Offers a variety of fresh, high-quality, organic foods;
- Reduces food losses common in large-scale production and distribution systems;
- Builds strong consumer-producer relationships;
- Cuts greenhouse gas emissions through less energy-intensive production methods and reduced transportation;
- Organic growing methods improve soil fertility and enhance agricultural sustainability; and
- Increases biodiversity, thus reducing risk of large-scale crop failure due to extreme weather events, diseases, or pest infestations.

Community supported agriculture

Community supported agriculture (CSA) is relatively new approach to food production and distribution in Montréal. It is based on creating partnerships between urban consumers and local farmers, in which the former make advance purchases of shares of produce from the latter and then receive weekly deliveries throughout the growing season. CSA has many economic, social, health, and environmental benefits, including climate change adaptation and mitigation (Box 3.3). In Québec, Équiterre has been promoting CSA since 1995. Today, the network comprises more than 40 farms that provide organic food to the Montréal region, and another 50 that serve other regions in Québec.

3.2 Prominent organisations involved in urban agriculture

Numerous agencies and organisations are working on advancing UA in Montréal. Their involvement provides direct opportunities to urban farmers and gardeners in terms of access to land and resources. More importantly, they help to give UA more credibility and put it in the spotlight of public attention (Nourrir Montréal 2007b).

Community organisations

The most important actors in UA are without a doubt the numerous community organisations in Montréal (Bertrand 2008). They are the "foot soldiers" who organise collective gardens, involve communities, change attitudes, and promote UA among municipal officials. Some organisations, like most of the collective garden associations discussed above, are only involved in the physical practice of UA at the community level. Their work is very important for developing UA at a local level. Others, such as Alternatives in particular, also promote UA at the level of policies and official attitudes by working with other actors to initiate new programs and to influence the public agenda. The uniting of collective garden associations into the Regroupement des Jardins Collectifs du Québec has helped to link efforts and make their work all the more effective, and yet it is important to recognise that these organisations depend on other agencies for funding, and that their success often depends of the commitment of a few dedicated individuals. Thus, community organisations alone, despite their important contribution, are not sufficient for developing UA.

Nourrir Montréal

A committee of the Conférence régionale des élus de Montréal, Nourrir Montréal acts as a roundtable for discussion and exchange among different groups interested in promoting food security in Montréal. Members of Nourrir Montréal include representatives from the food industry, education, aid foundations, municipalities, community organisations, and public health agencies (Nourrir Montréal 2006). The committee's primary mission is to promote food security. Its mandates include promoting social equality and reducing inequalities in access to food, promoting collaboration among various actors working in the sphere of food security, disseminating knowledge and information on the subject of food security, and influencing policy to promote food security. Nourrir Montréal is not a food policy council in that it does not have a municipally defined mandate and does not develop programs or drive policy. Rather, it is a place of exchange among key stakeholders in the food system (Bertrand 2008; Duchemin 2008). Its current role is to bring together various actors in order to help them exchange information and resources and identify common goals (Belleau 2008). However, the mission and specific agenda of Nourrir Montréal is still under development, and its role in the future is uncertain.

Publication series available at
http://www.santepub-mtl.qc.ca/
Publication/telecharg_gestes.html

Direction de santé publique de Montréal

The Direction de santé publique has a strong interest in promoting UA, mostly based on the goal to improve food security. In 2000 and 2001, it published a series of publications – Des gestes plus grands que la panse – documenting the state of the food system in Montréal and calling for more local, small-scale, and equitable food production and distribution practices. Since then, the Direction de santé publique has continued to lobby in favour of UA, increased food security, and

sustainability of the food system, and to work with various agencies and organisations to develop UA in Montréal. The Direction de santé publique is a key member of Nourrir Montréal, supporting the committee's projects and activities. It also lends financial support to collective garden association; for example, it helped start collective gardens in Pointe-Saint-Charles and has occasionally provided funding to ActionCommuniterre. However, it does not have sufficient resources to fund collective garden associations on a continuous basis (Bertrand 2008).

Centraide du Grand Montréal

A member of Nourrir Montréal and an active supporter of collective gardens, Centraide plays an important role in UA. As part of its broad agenda of developing engaged, healthy, and caring communities, Centraide promotes food security by funding food banks, collective kitchens, food purchasing cooperatives, and collective garden associations. In fact, Centraide is one of the most important sources of funding for collective garden associations in the Montréal region (Duchemin 2008).

Universities

The four Montréal universities play a number of important roles in UA, helping to promote the activity through research and practice. Research units such as the Minimum Cost Housing Group at the McGill School of Architecture help to develop UA through their publications, networking, and support of UA programs and initiatives. Student research projects and theses can bring to light new evidence, knowledge, and ideas. In recent years, interest in UA has surged, shown by the increasing number of studies, projects, masters' and doctoral theses produced by students

(Duchemin 2008). The universities also offer space on their campuses to collective gardening groups. For example, the Alternatives/Santropol Roulant Rooftop Garden Project has set up gardens on the campuses of the Université du Québec à Montréal and McGill University. In this way, the universities not only improve access to land, but also serve as spaces for pilot projects, which show that gardening can fit harmoniously into urban life and landscapes. Some universities, like McGill and Concordia, also run experimental farms in conjunction with academic programs in agriculture and operate their own gardens and composting programs.

Commission scolaire de Montréal

The Commission scolaire de Montréal has a keen interest in UA from the point of view of food security and education. It supports the idea of food gardens on school grounds as part of a greater food policy to ensure that Montréal school children have adequate access to healthy foods. The Commission works with collective gardens and other organisations to create vegetable gardens and run horticultural workshops (Duchemin 2008) Some of the schools that have food gardens include l'école Alternative de St-Lambert, l'école secondaire Jeanne Mance, l'école secondaire Évangéline, and l'école Élan (Direction de santé publique 2003). The Commission scolaire is also a member of Nourrir Montréal.

Youth garden at the Botanical Garden
Source: Montréal Botanical Garden

The Montréal Botanical Garden

The Botanical Garden has been a key player in UA for several decades. For example, it is in large part responsible for initiating the community garden program in the 1970s. Today, it supports a large demonstration garden and runs horticultural activities for the public. For

example, in the summer, the Garden holds an eight-week day camp for children between the ages of nine and 14, where each child tends and harvests one of the 440 small garden plots (Reid 2006). In partnership with the Friends of the Garden Society, the Botanical Garden also offers year-round horticultural workshops and courses for children and adults.

3.3 Montréal policy environment

Many programs and initiatives exist across Montréal, as documented above. Nevertheless, they have been implemented in a piecemeal and ad-hoc manner, and it will require a concerted effort to overcome the barriers posed by the current unsupportive policy context. In other words, although UA has a strong presence in Montréal, with many organisations actively practising and promoting local food production and distribution, these organisations work in a policy environment that is not highly supportive of their activities. Urban agriculture is not officially restricted, yet it is not formally recognised or valued by the City or its boroughs (Belleau 2008; Bertrand 2008). The existing community gardens and the PAZ lack priority on the municipal policy agenda, and there appears to be no municipal interest to expand UA (Duchemin 2008). The absence of active municipal support makes the advancement of city farming logistically and financially difficult for commercial farming operations, gardening associations, and UA advocates alike. For example, to gain access to land, urban farmers and gardeners must seek out appropriate spaces and negotiate with private and public land owners on an individual basis. This process is inefficient and time consuming, and offers insecure access. Funding is another major issue. For instance, the City does not finance soil decontamination for new UA initiatives, while funding for the existing network of community gardens is simply inadequate for ongoing

Box 3.4 Special policies

- Economic development plan
- Transportation plan
- Affordable housing strategy
- Urban revitalisation strategy
- Cultural development policy
- Montréal, knowledge city
- Heritage policy
- Montréal recreational facilities development plan
- Policy on large commercial advertising and billboards
- Wire & pole elimination plan
- Montréal Charter of Rights and Responsibilities
- Public consultation and participation policy
- Montréal's blue network
- Major parks network
- Tree policy
- Policy on the protection and enhancement of natural habitats
- Noise mitigation policy
- Strategic plan for sustainable development

expenses (Duchemin 2008). In addition, because the benefits of UA (environmental and otherwise) are not officially recognised, gardening organisations have had little success in accessing federal and provincial grants (Ayalon 2008).

Detailed scrutiny of current municipal policy documents demonstrates the lack of attention to UA. The glaring absence of policy statements on agriculture or the food system in general is one indication of the municipal neglect of UA. Montréal has identified numerous key policy issues and issued special policies and plans to address issues ranging from general economic development and public transit provision to the elimination of utility poles and overhead wires and noise mitigation (Box 3.4). It is surprising and unfortunate that neither climate change nor the food system receive the same careful attention. However, even if UA is not given priority, it is not entirely off the radar of municipal affairs. The official attitude of the City of Montréal towards UA is perhaps best expressed in two major policy documents – the Master Plan and the First Strategic Plan for Sustainable Development.

The Montréal Master Plan

The Montréal Master Plan makes several references to community gardens, green roofs, agriculture, public markets, and climate change. Through these, Montréal's attitude towards UA is clearly revealed.

Community gardens

Montréal has a long history of community gardens, as discussed above, and yet their value is not acknowledged. The fact that the community gardens are administered by the Department of Culture, Sports, Leisure and Social Development suggests that their function is perceived as largely seen as relating to leisure and recreation, rather than in terms of their many social, economic and environmental benefits (Duchemin 2008). The Master Plan further demonstrates that the community garden program is not viewed as an important feature of the city. In the entire document, community gardens are mentioned three times, all in passing. The first instance of community gardens appears in the Section *High-quality, diversified and complete living environments* in a side note on the Healthy City concept. It says that community gardens, as well as co-ops, purchasing groups, community kitchens, meals-on-wheels services and school lunches are ways to deal with education, employment, and food insecurity (Ville de Montréal 2005, 14). While the Master Plan subscribes to the Healthy City concept, it does not discuss the existing community garden program or propose concrete implementation measures to support its further development. In the same section, community gardens are mentioned again as part of a list enumerating Montréal's many community facilities (Ville de Montréal 2005, 23). A photo of a community garden also appears on that page. The third reference to community gardens appears in the section *A healthy living environment*: "As a general rule, the rights-of-way for lines carrying a current of 735 kV or less can be used for gardening and horticulture" (Ville de Montréal 2005, 194).

Montréal community garden
Source: Montréal Master Plan

These passive references hardly do justice to the important role that community gardens play in the city. The failure to mention community gardens in other sections further demonstrates the City's neglect towards them. For instance, community gardens are not discussed on the section on environment and green space, nor are they recognised as part of Montréal's heritage, despite their long history and important influence in the city's growth and development (Vandermeulen 2007). Furthermore, the Plan has no targets for increasing the number of community gardens, nor does it express any intention to do so.

The official neglect of community gardens is felt in practice, as well, both by participants and horticultural animators (Duchemin 2008). The gardens do not receive sufficient resources and are not well protected in the zoning code. Only six horticultural animators are available for the 76 community gardens, and some gardens do not have sufficient funding for equipment and proper composting facilities (Ayalon 2008; Vandermeulen 2007). Of the 76 city-run gardens, only 21 are zoned as park land, and thus protected. Others occupy land owned by the federal or provincial government or religious institutions. They are not protected by the zoning code, and some are in fact considered land reserves for future urban growth (Reid 2006). In recent years, no new community gardens have been created, and in 2007, eight gardens were closed due to soil contamination (Bagnall 2007). It is still uncertain whether these gardens will reopen, and if not, whether they will be replaced to maintain total the number of gardens.

Green roofs

The Master Plan gives more weight to green roofs than to urban food production. It recognises the aesthetic and environmental benefits of green roofs, including reduction of the urban heat island effect, and includes rooftop greening as an implementation measure to support healthier urban development and ecologically-sound architecture. However, only in one instance, as part of a side note on green roofs, does the Master Plan consider the possibility of using green roofs for UA (Ville de Montréal 2005, 133). It seems that productive rooftop gardening is not a priority in the Master Plan.

Agriculture on the island of Montréal

Permanent agriculture zone
Source: Montréal Master Plan

Agriculture is discussed at significant length only in relation to the West Island PAZ. The Master Plan recognises the importance of the PAZ as an ecological reserve and seeks to preserve and enhance it rural character. However, it acknowledges that agricultural activities are marginal in this area due to a lack of vitality in the farm community (Ville de Montréal 2005, 127). It therefore includes concrete steps to foster an environment conducive to the expansion of farming, to further develop the agricultural zone, to ensure that new activities do not conflict with agriculture, to promote agricultural tourism in the area, to maintain the PAZ boundaries, and to develop a strategic plan to enhance agricultural activities in the PAZ. As in the previous examples, however, the Master Plan aims at best to maintain existing agricultural land, but does not seek to increase the amount of agriculturally productive land on the island.

Kiosque Mont-Royal

Public markets

The Master Plan recognises that public markets enhance living environments and increase access to quality foods, and favours the development of more markets (Ville de Montréal 2005, 20). This language demonstrates a positive attitude, but insufficient appreciation of farmers' markets as a vital element of the greater food system. Aside from enhancing local economic development, public health, and neighbourhood quality, public markets are also an integral part of a climate change adaptation and mitigation strategy since they help to maintain viable small-scale commercial farming operations. Yet, these links are not made in the Master Plan.

Climate change

The City recognises its responsibility and ability to contribute to the goals of the Kyoto Protocol. The Master Plan explicitly seeks to reduce greenhouse gas emissions through a sustainable development model, which aims, in part, to reduce car dependency and protect natural environments. It acknowledges the threats climate change poses to Montréal and lists implementation measures to mitigate climate change. Yet, the Master Plan is silent on the subject of climate change adaptation. More importantly, while the Master Plan seeks to address climate change, it focuses overwhelmingly on the transportation sector, failing to recognise the important contribution that food systems planning, including planning for UA, could make in terms of climate change adaptation and mitigation.

Although the Master Plan mentions agriculture, community gardens, public markets, green roofs, and even climate change, it does not formally recognise the value of UA activities for the city, does not give UA the status of an integral urban system, and lacks concrete measures, let alone a comprehensive framework, to integrate UA into policy and practice. The Plan also fails to make connections between UA and other urban issues, such as transportation, public health, waste management, economic development, environmental planning, food security, and climate change. For instance, composting is mentioned only in passing in the waste management section; the economic development plan is overly focused on industries considered to be cutting-edge, such as high-tech, finance, and culture and entertainment, overlooking the food industry entirely; food insecurity is mentioned only once in the side note on the Healthy City concept; and the greening efforts seem to be directed overwhelmingly towards trees and large parks, neglecting small farms and gardens. In addition, the zoning code maintains a clear and deeply-ingrained separation between urban and agricultural land uses. Agricultural activities are strictly confined to rural areas, and neither mixed use nor green space zones include food production as an appropriate activity. Urban agriculture is intimately linked to many pressing urban issues, yet the Master Plan fails to recognise its potential benefits.

First Strategic Plan for Sustainable Development

The Strategic Plan for Sustainable Development, produced in 2007 by the Service des infrastructures, transport et environnement sets out priority actions to ensure environmental, social, and economic sustainability at the municipal level. One of the actions in the Plan is to stimulate the development of urban agriculture in Montréal, and in this respect it signals a

change in the official attitude towards UA in Montréal. In effect, this is the first and only policy document to date that is explicitly supportive of UA. Its short section on UA is significant because it recognises the main contributions of UA and identifies future steps based on current barriers. First, the Plan acknowledges the key environmental, social, and economic benefits of UA, such as greening and the reduction of the urban heat island effect, as well as the importance of decreasing greenhouse gas emissions from transportation. Although this section does not make as explicit reference to climate change adaptation as it does to UA, it does make the direct links between the two.

Of particular note, the Strategic Plan designates principal roles for the City concerning UA. This includes maintaining the community garden program in underprivileged neighbourhoods, offering aid to citizens who wish to practise UA, and facilitating access to residual underused spaces by negotiating agreements with large property owners. These are important roles for the municipality because they help to overcome the major barriers to urban farming and gardening – the lack of formal support, resources, and access to land. The Plan also proposes two steps for the future development of UA: a strategy to promote UA and a guide of good practices. A strategy on UA is particularly necessary because, although the Strategic Plan is a big step in the right direction, it only the beginning of a policy discourse and planning process that needs to take place to integrate UA into the municipal policy agenda and urban fabric. Nonetheless, the inclusion of UA in the Plan for Sustainable Development is an important bench-head for UA in the Montréal policy environment.

3.4 Popular attitudes toward urban agriculture

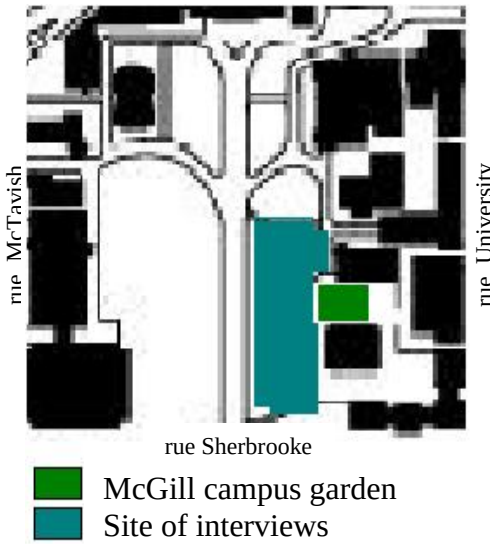


Figure 3.3 Site of surveys

Whereas the official municipal attitude is still ambivalent and just beginning to change, the popularity of community gardens and the rising number of collective and rooftop gardens are clear indicators of the positive public attitude toward UA. In just a decade, membership in Montréal's collective gardens rose from zero to over 2,000. The city's community gardens are full and new members must often wait for several years to get a parcel. A central argument in this study is that there exists in Montréal an interested, engaged, and positively-minded public, which represents a great opportunity for developing UA at a larger scale in spite of official neglect by municipal decision-makers. Popular support and a united citizen front can together put significant pressure on municipal policy and act as powerful motors for change.

In the spirit of tapping into popular support for UA, and to further gauge the perceptions of the general public in this respect, a study was undertaken in Summer 2007 in the form of short face-to-face interviews (Appendix A). The site of the survey was the downtown campus of McGill University, where a demonstration garden had been installed as part of the Making Edible Landscapes (MEL) initiative, an ongoing project of the Minimum Cost Housing Group and Urban Design Program at the McGill Schools of Architecture and Urban Planning, and in partnership with the Rooftop Garden Project, jointly run by Alternatives and Santropol Roulant.[2] In full view of the demonstration garden on the lower campus of the University (Figure 3.3),

[2] The Rooftop Gardening Project is a partnership between Alternatives, an international cooperation network, and Santropol Roulant, a community organisation in Montréal. Together, the two organisations are working to spread the practice of rooftop gardening in Montréal and around the world. They develop and implement ecologically sustainable soil-less growing techniques that are affordable and light-weight enough to be used on rooftops, balconies, walls and other small urban spaces. The food that is grown in the Montréal demonstration garden is cultivated entirely by volunteers, and goes directly to nourishing seniors and others living with a loss of autonomy (The Rooftop Garden Project 2008).

passers-by were randomly selected to express their thoughts and opinions concerning growing food in the city in general terms. They were also asked to give their reactions to the McGill garden itself. It should be noted that specific questions about climate change were not included in the questionnaire instrument, as the primary purpose was to gauge the general reaction to the presence of food-growing in the city. A total of 49 respondents were questioned, and although the sample is not large enough to draw definitive conclusions, the results are very compelling indeed.

The survey respondents were almost evenly split between individuals affiliated with McGill and others (Table 3.1), many of whom were downtown workers having lunch on the campus grounds and visitors. Those affiliated with McGill came from several academic departments, including physical and social sciences, health, law, and management; and others included office workers and various professionals. There were slightly more men (57 %) than women (43 %) and four in five were 20 to 40 years of age. While 11 live outside Canada, most respondents were from central Montréal as indicated by the first three digits of their postal code. Participants were also asked about their personal experience with gardening in the city. Only about a quarter (27%) said that they grow, or have in the past grown food in the city; they reported two principal motivations: recreation and inexpensive procurement of high-quality food. Three quarters (73%) reported to have never grown food in the city, mostly because they either have no space, no time, and/or lack skills or interest. A notable majority (63%), however, is aware of food production activities in Montréal and cited examples such as community and residential gardens. Moreover,

Table 3.1: Do you have any affiliation with McGill University?

Student	43%
Professor	4%
Other Staff	6%
No affiliation	47%

Table 3.2: Given an easy and affordable option to garden in the city, would you do it?	
Yes	63%
No	21%
Don't know	16%

Table 3.3: 'Growing fruits and vegetables in the city is generally a good idea.'	
Neutral	14%
Agree	20%
Strongly agree	65%

Table 3.4: 'Using rooftops for growing food is generally a good idea.'	
Disagree	4%
Neutral	13%
Agree	27%
Strongly agree	56%

many showed interest in cultivating their own garden if shown an easy and affordable way to do so (Table 3.2).

In general terms, the respondent attitudes to gardening in the city and urban food production are overwhelmingly positive. A great majority of respondents said that growing fruits and vegetables in the city is a good idea (Table 3.3); only 14% were neutral, and there were no negative responses. People were slightly more reluctant to say that rooftop gardening is a good idea (Table 3.4), either because they were unfamiliar with the practice or owing to concerns about how safely a given roof structure could support the weight of gardens. Nonetheless, many respondents made positive comments about rooftop gardens, recognising their beauty and ecological benefits, and the opportunity to make efficient use of currently underused rooftop space. When asked an open-ended question about why or why not urban food production was generally a good idea, responses were overwhelmingly positive (Box 3.5). Among the very few concerns expressed by respondents were air pollution, squirrels, and the belief that space in city should be used for housing rather than gardening. A question was also asked of the respondents concerning the potential social benefits, in response to which there was a near-unanimous opinion that gardening enhances the quality of life of city residents: the mean score for this question was 4.7 out of 5. These results are remarkable in light of the fact that respondents were not affiliated with the Rooftop Garden Project and that most have not had any experience in gardening.

Box 3.5 Benefits of urban agriculture as articulated by respondents

- It is a pleasant, relaxing activity
- It is good for the environment
- It is local and sustainable
- It enhances self-sufficiency and food security
- It is beautiful
- It is an affordable source of fresh, organic food
- It is good for the community
- It raises awareness about environmental issues

Participants were asked a closed-ended question about what categorical types of city sites they saw as being appropriate for UA. Nearly three in four of respondents agreed that public buildings, such as schools, universities, libraries, and others, should incorporate food production. In more specific terms, there was unanimity that residential backyards should be used for food production, and a large majority said that rooftops (90%), patios and balconies (92%), and university and college campuses (92%) are also suitable for UA. School and daycare yards (78%) and underused parking lots (69%) also received a majority of positive responses, and about half agreed that hospital grounds (55%) and alleyways (45%) should be used for food production. Of particular note is the fact that not one respondent said that food production is not an appropriate land use in urban areas. In other words, there is no evidence from this admittedly small and non-representative sample that there are overtly negative attitudes toward developing UA. Yet there were clear preferences expressed by respondents for some spaces over others. These responses can serve as a guide to implement food gardens in the least controversial spaces first. The responses also hint at the power of demonstration gardens to change popular attitudes: because the interviews were conducted within sight of the Alternatives/Santropol Roulant Rooftop Garden, people may have been especially positively struck by the idea that fruits and vegetables can and should be grown on university and CÉGEP campuses. Thus, planting food gardens in unconventional places and bringing them to the attention of the public may be an effective way to increase support for UA.

The respondents indicated that they had various concerns about growing food in the city when questioned directly in this respect. Almost all individuals reported at least one concern, and more

often identified several, while only 18% stated that they had no concerns or issues. The most common worries – as expressed by about half of respondents – were that air pollution (53%) and/or soil contamination (47%) would harm the quality of the produce. Yet, an overwhelming majority (93%) said that they would eat fruits and vegetables grown in the city if they were offered. Vandalism and theft were also significant concerns, as respectively identified by 33% and 25% of respondents. Only one of the 49 respondents felt that UA is visually unappealing or that it takes up valuable land in the city. The concerns expressed by these individuals are quite legitimate, and should be directly addressed by those who practise and promote UA. In particular, the effects of soil contamination and air pollution need to be adequately evaluated to ensure that the food produced in urban gardens is safe for consumption, and perhaps more importantly, this information needs to be diffused to the general public to allay fears and concerns. Addressing these matters is an important avenue for further raising public support for UA.

McGill campus Rooftop Garden
Source: The Rooftop Garden Project

Given the proximity of the Alternatives/Santropol Roulant Rooftop Garden, a series of questions addressed the awareness of respondents about this productive food site. Three in five (61%) respondents reported having seen the garden before being interviewed, although only about half had noticed that food was being grown there, and only one in four (25%) were aware of the community partnership that had brought it into being.[3] Nonetheless, once the garden was brought to the attention of respondents, their reactions were overwhelmingly positive. To capitalise on this anticipated surprise element, respondents were asked about their initial reaction to the

[3] Information flyers about the Rooftop Garden Project were offered to survey participants raise awareness about this project and rooftop gardening in general (Appendix B).

Table 3.5: The roles of various actors in urban agriculture	
What roles should the local government play in UA?	
Promote	86%
Oversee	16%
Play no role	4%
What roles should Éco-Quartiers play in UA?	
Promote	83%
Oversee	26%
Play no role	2%
What roles should community organisations and NGOs play in UA?	
Promote	91%
Oversee	16%
Play no role	2%
What roles should School boards play in UA?	
Promote	76%
Oversee	9%
Play no role	18%

garden. The responses fell into two main categories: pleasure and surprise. Specific comments revealed that individuals were impressed (e.g., 'good idea' or 'what a space!'), shocked and pleasantly surprised (e.g., 'rather extraordinary' or 'wow'), and happy that the space was being used well (e.g., 'wow, someone is using the space!' and 'good use of the space'). Most people perceived it to be interesting, beautiful, and a good addition to the grey concrete that dominates the area in which the garden was set up. A few people commented on the aesthetics of the garden and suggested that it could be improved by putting the plants directly in the ground or in nicer-looking containers. All in all, 92% of the respondents agreed that this garden should become a permanent feature on the McGill campus. Moreover, 98% of the respondents stated that similar food gardens should be introduced in other places in the city, such as on other campuses, on vacant lots, in parks, and on hospital grounds. Extrapolating from these results, it appears that despite certain concerns or preconceptions, the Montréalais favour the spread of urban food production and perceive it as harmonious with the urban landscape when they see it in practice.

A final set of questions explored respondent attitudes toward the role that various actors should play in UA. As summarised on in Table 3.5, there was an overwhelmingly positive sense that local government should promote UA, as indicated by 42 of the 49 respondents – almost 90%. Among three types of organisations that can or already do play important roles, most respondents felt that all three should promote UA. Overseeing (i.e., delivering and managing) the process was seen as a less important role for all four sets of actors, but the Éco-Quartiers were identified as the most appropriate organisation for this role. Only a handful of respondents answered that they should play no role at all, particularly the school boards (which 18% identified in this respect).

If a single conclusion is to be drawn from the results of this primary research, it is that people who have no practical stake in urban agriculture are nonetheless highly supportive of the practice and see its purpose and value. The survey results show that the public recognises the many benefits of urban food production, that city residents are supportive of UA, and that the general population favours municipal action to promote its practice. The findings therefore suggest that popular perceptions are unlikely to be a barrier to the further development of urban agriculture in Montréal, and on the contrary, constitute a receptive environment for change.

The analysis of urban agriculture in Montréal affirms the potential for municipal action to address climate change through UA. Agricultural activities have a strong presence in the city, and there is evidence that they are becoming more widespread and entrenched at the community level despite official neglect. Popular attitudes towards urban food production are overwhelmingly positive; unlike reported in literature, the Montréalais do not seem to view agriculture as incompatible with cities. Rather than representing barrier a to UA policy development, the public is likely to be a strong supporter of a changing municipal policy environment on urban agriculture. The City of Montréal, along with other municipalities in the Montréal metropolitan region, needs to realise that UA represents a great asset for the city and an excellent climate change adaptation and mitigation strategy. By looking to policy examples from other cities and collaborating with local community actors, Montréal can build on this asset to improve the urban quality of life and effectively address climate change at the local level.

Chapter IV

Toward an urban agriculture policy framework for Montréal

Based on the analyses presented in the first three chapters, this final chapter proposes an urban agriculture policy framework for the City of Montréal. Policy is defined here as the union of laws, regulations, implementation procedures, and enforcement actions towards a goal (Bourque 2000). The goal of the policy measures proposed in this chapter is the development of urban agriculture as a climate change adaptation and mitigation strategy. As discussed in Chapter I, urban agriculture can have tremendous benefits in terms of climate change adaptation and mitigation, and it is argued here that a policy that supports and induces the development of urban agriculture is an important and effective response to numerous challenges presented by climate change. In Chapter II, it was demonstrated that some cities have already taken steps to adopt urban agriculture as a sustainable development strategy. In documenting the state of urban agriculture in Montréal, Chapter III revealed that even though urban agriculture has a strong presence in the city, the municipal government does not value this asset and does not seek to develop it further. Nonetheless, the empirical results of the Summer 2007 study suggest that there is widespread popular support for urban agriculture. This chapter consists of three parts: first, it makes a case for a stronger municipal role vis-à-vis urban agriculture. It then discusses procedural issues of policy formulation and finally recommends measures to promote the development of urban agriculture. The chapter is focused specifically on Montréal because it is based on the detailed study of the Montréal context performed in the previous chapter, and although this discussion may to some degree be appropriate to other contexts, an in-depth analysis is always a necessary prerequisite to making context-specific and relevant recommendations.

4.1 Municipal role in urban agriculture

Municipal leadership in urban agriculture is long overdue. Although UA is not a panacea to urban problems, it is an essential strategy that fits like a missing puzzle piece into the existing lattice of municipal policies and can significantly contribute to numerous urban development objectives, especially given contemporary concerns over and the need for action in response to climate change. The abundance of literature calling for municipal policy in support of UA suggests that it is highly pertinent to contemporary cities around the world. Furthermore, as shown in Chapter III, those who practise and promote UA and the general public in Montréal believe their City should play a stronger role in UA than it currently does. The following paragraphs discuss four interlocking reasons why municipalities should actively encourage agriculture in urban areas. First, UA is a necessary climate change adaptation and mitigation strategy whose time has come. Second, a proactive policy on urban agriculture meshes well with other municipal objectives and offers numerous environmental, social, health, and economic benefits. Third, municipal policy is necessary to overcome current barriers to UA, some of which are created precisely by the currently unsupportive policy environment. Finally, it is argued that a comprehensive policy to guide UA development will also serve to mitigate potential hazards and pitfalls of agricultural activities.

The general problématique that has inspired this study is quite simple: climate change has become a stark and unavoidable reality. In response, adaptation and mitigation strategies must be integrated into all municipal policies, from transportation to economic development, housing, and infrastructure planning. It has been argued here that the food system, which has up to now received little attention on the municipal policy agenda, must be given greater priority: not only

Marriott Hotel, Victoria, BC

is it an important urban issue in itself, it is also a vital aspect of climate change adaptation and mitigation. As discussed in Chapter I, UA plays three key roles as an adaptation strategy: ameliorating urban microclimates, improving water retention, and increasing food security. Urban heat islands are already becoming a more serious concern in Montréal, exacerbated by longer and more extreme summer heat waves (CRE 2007). Urban agriculture is an excellent strategy to reduce the UHI effect, especially where trees cannot be planted, such as terraces, roofs, and balconies. Higher temperatures and more erratic precipitation events are also likely to increase droughts and surface runoff in mineralised urban environments (Logé 2008). Urban agriculture can serve cities as a water management strategy, helping to hydrate urban soils and minimise runoff, thereby reducing damage to infrastructure and the need for greater waste water treatment capacity. In addition, urban farms and gardens increase food security for city residents (Koc et al. 1999). Shifting climatic zones, more frequent extreme weather events, increasing droughts, and rising sea levels are all outcomes of climate change that pose risks to the current food production system. In response, local food production, processing, and distribution must be prioritised in municipal policy and planning. Developing urban agriculture on a larger scale is a necessary adaptation measure to reduce the risks climate change poses to urban populations, which simultaneously increases biologically productive green space and cultivates a local and diversified food system. In addition, UA helps to mitigate further climate change, reducing the magnitude of climate-change-related crises and the need for more drastic adaptation measures in the future. Thus, UA is in essence a climate change adaptation and mitigation strategy, and the recommendations for a UA policy framework that follow have direct and important implications for climate change.

In broader terms, urban agriculture deserves municipal attention because it also serves a number of important community functions for city residents and helps to improve the urban quality of life (Bourque 2000). Although farms and gardens may bring in little in the way of tax revenues, they enhance local economic development, public health, environmental quality, and community wellbeing. Urban gardens are an effective and inexpensive way to revitalise derelict land and beautify underused spaces, all the while engaging city residents in meaningful ways and improving neighbourhood quality (Bhatt and Kongshaug 2005). When these benefits are recognised and valued, it becomes clear that UA is a highly effective urban development strategy because it simultaneously accomplishes many objectives. "Local governments need to awaken to the fact that, for relatively small investment in personnel, capital, and legislative and regulatory change, they can catalyze communities to help solve so many of their immediate needs" (Bourque 2000, 141). By developing a policy framework on UA, the municipality can use agriculture to guide urban development towards multiple desired goals in an efficient and effective manner.

Municipal involvement in urban agriculture is vital because there are barriers to UA that can only be overcome through policy. Urban agriculture works very well as a community-organised grass-roots activity, but barriers to UA warrant municipal involvement. By creating a policy context that minimises barriers and facilitates people to create their own solutions, the local government can unlock the potential of what is currently happening at the community level. Key informants interviewed in this study expressed frustration over the municipality's ambivalent attitude towards urban agriculture and the opinion that the municipal government should play a

stronger role to address existing barriers. They also stressed, however, that this role should be to facilitate and support its practice without creating an overly rigid policy environment that would restrict current grass-roots initiatives. There was a common feeling that the municipality's policy needs to be well attenuated to the needs of communities, helping them to come up with solutions without overly structuring and constraining their activities (Ayalon 2008; Hautecoeur 2008; Duchemin 2008; Belleau 2008). One of the most important things the municipality should do is champion existing urban agriculture activities (Ayalon 2008; Duchemin 2008). As an advocate and facilitator, the municipality should also help urban farmers and gardeners get access to suitable, uncontaminated land and other spaces where food can be grown; improve access to financial and technical resources; and act as a central coordinator that helps urban farmers and gardeners exchange information, resources, and expertise. Strong commitment and strategic involvement on the part of the municipality in urban agriculture will allow the city to reap the greatest benefits in a manner that optimises current efforts and saves resources.

Finally, the municipality has a strong interest to be involved in UA planning in order to mitigate negative impacts such as public health hazards, nuisances, and land use conflicts. Experience shows that UA will be practised whether it is formally recognised or not. In the absence of a policy and regulatory framework to manage agricultural activities, it is more difficult to prevent potential problems and address existing ones. By developing a clear policy, the City can set standards, procedural guidelines, and quality control requirements to regulate good practice, avoid conflicts and pitfalls, and guide UA development towards the desired ends.

4.2 Policy formulation and implementation strategies

Having established the need and desirability of municipal policy on UA, the question remains: how should such a policy be developed? This section highlights three important guidelines for policy making. First, the policy formulation process should be based on a solid understanding of current conditions. Second, it must include key stakeholders and be open to public participation. Finally, it should be a continuous and iterative process of reformulation based on feedback.

The first prerequisite to policy development is a careful analysis of current conditions, players, challenges, and opportunities (Bourque 2000; de Zeeuw et al. 1999; Quon 1999). As evidenced in Chapter III, urban agriculture in Montréal is practised in many forms by various actors. In addition, a number of organisations and agencies are working to promote UA development. An urban agriculture policy must acknowledge the roles of existing players, their powers, constraints, and the relationships among them. Only with a good knowledge of the current conditions can policymakers identify the best opportunities for action and promote ongoing efforts instead of working against them. Specifically, this analysis should include an inventory of urban agriculture, land-use mapping, a review and analysis of the policy and legislative framework on urban agriculture, and also an inventory and analysis of stakeholders (de Zeeuw et al. 2006).

To be effective, a policy formulation process should be inclusive, collaborative, and open to public participation to ensure that policies are responsive to local needs and acceptable to all stakeholders. First of all, municipal actions need to be well-attenuated to the needs of communities: formal, top-down approaches by the municipal government need to blend well

with current informal, bottom-up initiatives. Community gardens are one example: waiting lists indicate that there is an unfilled demand for community gardens, and that demand is stronger in some neighbourhoods over others. The local government should take such cues as guidance for policy and program development in order to respond to community needs without imposing an inflexible top-down structure. To ensure that policy is flexible and responsive, those actors currently involved in UA should be included as key stakeholders in the policy formulation process. In Montréal, they include community organisations, urban farmers and gardeners, the Direction de santé publique, Centraide, the Commission scolaire de Montréal, and university researchers, among others. The multi-sectoral nature of UA also demands the involvement of numerous municipal departments, although one department may be given primary responsibility for UA. They include departments responsible for land use planning, the environment, waste management, economic development, public health, social and community development, housing, and management of parks and green spaces. In addition, because the jurisdiction of Canadian municipalities is limited by provincial powers, municipal governments should seek to work in partnership with the province to promote UA. In turn, the Québec provincial government, and the Ministère des Affaires municipales et des Régions in particular, should acknowledge the importance of urban agriculture for cities in Québec and endorse municipalities to develop UA in policy and practice. Regional coordination among municipalities is also important to ensure the widespread and harmonious implementation of urban agriculture policies across municipal boundaries and to allow UA activities to feed off each other at the regional scale. At the local scale, it is vital that the central city government collaborate with arrondissement administrations to ensure successful implementation of policies and programs

proposed at the central level. Finally, the policy formulation process should be open to public participation because city residents have a direct stake in urban agriculture. Addressing public concerns and satisfying the public's needs at an early stage will ensure the success of the policy at the implementation and enforcement stages.

Ultimately, the policy should be periodically evaluated and revised as current conditions evolve. Thus, the policy formulation process should be iterative, moving from problem evaluation to policy creation to implementation and back to problem re-evaluation (Bourque 2000). Experiences gained during implementation should feed the ongoing policy (re)formulation process. This process will ensure that policies respond to changing needs, constraints, and opportunities, and that resources are used efficiently.

4.3 Recommendations

This section proposes a set of measures that the Montréal municipal administration can adopt to support the development of urban agriculture as a proactive response to climate change. These recommendations are presented as a starting point for a policy discussion that needs to take place with the leadership of the local government and participation of key stakeholders, especially the community organisations to which reference has been made throughout this study. They address numerous sectors and activities of urban agriculture, including commercial farming, food distribution, agricultural inputs, and the various types of gardening. A hierarchy of tools, including education, incentives, and power are proposed. As is so often the case, education is the most necessary and simple first step, followed by incentives, which should be considered where

municipal resources permit. Finally, an infusion of power – including the development and enforcement of mandatory policies – can be highly effective, but demands greater political and financial commitment and thus may not be possible until urban agriculture becomes more widespread through the former two steps of education and incentive-based programs.

The recommendations presented below are principally designed as responses to current barriers as identified by those who practise and promote UA in Montréal. Recommendations from the literature and successful policies in other cities, as reviewed in Chapter II, have also contributed to the proposed set of measures. The first two recommendations deal with the creation of an institutional home for urban agriculture and the third addresses the four major sets of challenges to UA: (a) the lack of formal recognition and support; (b) weak networks among the actors in UA; (c) poor access to suitable land; and (d) insufficient financial and technical resources.

Recommendation 1: The City of Montréal should first and foremost establish a regional food policy council, with at least one permanent full-time staff position, as an advisory body to municipal governments in the Montréal metropolitan region. The multi-sectoral nature of the food system demands a multidisciplinary body that brings together various departments, agencies, organisations, and other stakeholders representing diverse interests and motivations across the metropolitan region. This body should be given a horizontal mandate, such as that of the New Zealand Parliamentary Commissioner for the Environment, to review the policies of all municipal departments for congruency with the objectives of food systems

planning, including urban agriculture and climate change adaptation and mitigation.[4] Its principal tasks would be:

- To consolidate existing research produced by the Direction de santé publique, university researchers, and others;
- To identify gaps in research and conduct and direct further study accordingly;
- To elucidate the relationships between the food system and other urban issues, including climate change, food security, transportation, environment, economic development, sustainability, health, revitalisation, poverty reduction, and cultural issues;
- To coordinate among municipal agencies, community organisations, and other stakeholders in the urban food system;
- To call attention to municipal policies that are incongruent with the objectives of food system planning and recommend changes;
- To orient a food systems strategy by developing consensus about priority goals and actions; and
- To develop and support programs to improve the local food system.

Recommendation 2: The City of Montréal should charge a single municipal department with the responsibility to develop and manage urban agriculture. Its mandate would be narrower than that of the food policy council and be limited to the City of Montréal. As

4 The Parliamentary Commissioner for the Environment is an independent Officer of the New Zealand Parliament who has horizontal powers to provide advice on environmental issues and to review the system of agencies and processes established by the Government to manage the environment. The Commissioner may: investigate any matter where the environment has been or may be adversely affected; assess the capability, performance and effectiveness of the New Zealand system of environmental management; and provide advice and information to assist people to maintain and improve the quality of the environment (PCE 2008).

discussed in previous chapters, a food policy council is an important step towards integrating UA in municipal policy, but it is not sufficient because, as an advisory body, it does not have the powers to create, implement and enforce policy. Thus, a municipal department needs to take on a formal mandate to promote and develop urban agriculture. The department in the City of Montréal which is most suitable to lead urban agriculture development is the Service des infrastructures, transport et environnement, as it has already begun work enfolding key aspects of UA by developing the First Strategic Plan for Sustainable Development. Another option could be to create a municipal department of food and charge it with responsibility for UA. This option, however, is less financially feasible, and may further complicate the already large and complex municipal bureaucracy and encourage work in administrative silos. Currently, the proposition of integrating UA planning into the mandate of a municipal department seems to be a distant reality in Montréal, partly because UA is still not recognised among municipal officials, and partly because the City is financially and politically limited in the actions it can take. The recent municipal mergers and de-mergers and the decentralisation of municipal functions to borough governments has left the central City government with significantly less power (Belleau 2008). Nonetheless, the City can in principle play a stronger role in the development of UA for climate change adaptation and mitigation, and the eventual possibility of giving a formal mandate to develop UA to a central City department should not be dismissed. The principal roles of the department responsible for UA should be:

- To maintain a staff dedicated to supporting and developing urban agriculture;

- To consolidate existing knowledge, and to commission and perform further studies on urban agriculture, particularly on the most effective ways to use urban agriculture as a climate change adaptation strategy;
- To develop a central vision for the role of agriculture in the city that combines and reflects the individual visions of key stakeholders, and which includes climate change adaptation and mitigation as primary goals;
- To produce a strategic plan on urban agriculture with the collaboration of key stakeholders, which addresses major barriers to UA and responds to community needs, and which uses UA to address climate change to the best of its potential (e.g., focusing on reducing urban heat islands; increasing the amount of permeable surfaces; enhancing ecologically-benign, economically-viable local food production, processing and distribution; decreasing transportation of foodstuffs);
- To collaborate closely with the food policy council, contributing to its working and taking its advice as guidance;
- To work in partnership with other municipal departments on aspects of UA that concern those departments;
- To encourage the administrations of Montréal arrondissements to implement policies and programs on urban agriculture;
- To coordinate policy development with other municipalities in the Communauté métropolitaine de Montréal;

- To include urban agriculture in official statistics, setting targets and developing an indicator framework to assess progress, in which climate change adaptation and mitigation should be prominent among the objectives, targets, and indicators; and
- To evaluate the state of UA in Montréal and its real and potential contribution to climate change adaptation and mitigation efforts on a continuous basis, and thence to formulate, implement, and enforce policies accordingly.

Recommendation 3: The City of Montréal should involve the key administrative actors in local planning for urban agriculture to overcome current barriers. At the level of the central municipal government, the Service de la mise en valeur du territoire et du patriomine and, to a lesser extent, the Service des infrastructures, transport et environnement have particularly important roles to play in UA because they are officially responsible for how land is used in the city. In addition, other municipal departments should be involved in aspects of urban agriculture that overlap with their mandates. Due to the decentralised nature of the local administration, it is also imperative that arrondissement governments be genuinely involved in policy development, and especially in implementation and monitoring. As the administrative bodies closest to the public, the arrondissements can play the most effective role in working with local communities. The central city government can encourage arrondissement administrations to play more active roles in urban agriculture by creating an overall favourable policy environment and taking practical steps to help them implement policies and programs.

First, municipal actors must *formally recognise the value of urban agriculture* in principle and practice:

- Educate municipal staff, and urban planners in particular, about the many functions and benefits of urban agriculture;
- Officially recognise the importance of the food system and agriculture to the city in the Master Plan, acknowledging the multiple functions and benefits of UA and the links between UA and other urban issues;
- Valorise and champion existing UA activities, including community gardens, collective gardens, farmers markets, and urban farms, and commit to their protection, support, and further development;
- Officially advocate for community, collective, and productive rooftop gardening;
- Promote multifunctional land use by modifying the zoning code to include UA activities (gardens, commercial farms, public markets) as an appropriate land use in other land use categories; and
- Act as leading partners in the establishment of a food policy council and the development of food policy in Montréal.

Second, it is imperative the local planning system in Montréal *support existing programs and initiatives, strengthen networks, and promote dialogue*; this should involve the participation of the City's Office de consultation publique:

- Endorse and strengthen the gardening and farming communities in their ongoing efforts to practise and promote urban agriculture;

- Create a public forum for the exchange of information, research findings, experience, and expertise;
- Foster communication networks among urban food producers, processors, distributors, and consumers;
- Facilitate networking and dialogue among community garden members to help them identify and express common concerns, needs, and visions;
- Promote partnerships between urban farmers and public institutions, such as schools, daycares, prisons, and hospitals; and
- Facilitate the establishment of producer organisations in which members can assist each other and exchange resources and information.

Third, the City must take steps to *improve access to land for urban agriculture*. Examples include but are not limited to the following:

Vacant land with potential for UA

- Provide public access to an interactive map or database of vacant lots and open land available and suitable for urban agriculture;
- Protect existing community gardens, and seek to decontaminate or replace the community gardens closed due to soil contamination;
- Study the demand for community gardens and establish new community gardens in the neighbourhoods where demand is strongest;
- Make available some public lands in parks, around municipal buildings, schools, public housing, and hospitals for the purposes of food production;
- Use land along public rights-of-way to plant fruit trees and edible landscapes;

- Create opportunities for productive rooftop gardening on public buildings;
- Offer municipal funding and help secure federal and provincial money to decontaminate land for agricultural uses;
- Provide economic incentives, such as property tax reductions, to private property owners to encourage them to create productive planting zones on their land and buildings; and
- Set requirements or give incentives for new developments to allot a certain percentage of land area for food production.

Finally, the City should *provide resources, services, and technical support to urban farmers and gardeners*. This should be part of the mandate outlined above in Recommendation 2, and the following steps are especially important:

- Gather and disseminate research and information on appropriate technologies for urban agriculture, good business practices, and available resources and assistance programs;
- Maintain an adequate staff of horticultural experts who organise training workshops and are available to assist urban farmers and gardeners;
- Develop financial assistance programs for urban farmers and gardeners in the form of start-up capital, grants, loans and credit;
- Offer financial assistance to urban farmers and gardeners for soil testing and decontamination;
- Promote the establishment of a network of small stores that will provide tools, seeds, soil amendments and pest controls to urban farmers and gardeners;

- Provide incentives, such as reduced taxes, to enterprises that produce high-quality, environmentally-friendly agricultural inputs;
- Promote the private provision of crop insurance;
- Establish new public markets, especially in neighbourhoods where there currently are none;
- Promote the development of a network of decentralised micro-scale private and non-profit composting operations, and encourage partnerships with urban farms and gardens; and
- Promote rainwater collection for use in urban agriculture through an education program and subsidies for on-site stormwater management (rainwater collection and storage systems).

4.4 Summary

This study has built the case that it is imperative for local governments to develop a supportive policy environment on urban agriculture as a strategy to address climate change at the local level. Chapter II revealed that several cities in North America have already taken steps to adopt UA policies promoting its practice, although not explicitly as part of a climate change adaptation and mitigation strategy. The analysis of the Montréal context performed in Chapter III indicates that conditions in Montréal are highly favourable for the integration of UA into municipal policy. Most significantly, the Montréal community is highly supportive of UA, and has indeed been actively working to expand its practice in the course of the last decade. Community-organised initiatives, however, face considerable challenges posed in part by an unsupportive policy

environment. Municipal action is thus warranted to help community-level actors overcome these challenges. Moreover, the local government should seek to develop UA at a larger scale in order that it make a significant impact in terms of climate change adaptation and mitigation. Climate change is a grave concern that demands an immediate response to avoid serious calamities. Urban agriculture is an avenue that can help urban populations face the challenges of global warming and mitigate further climate change at a local level with modest financial investment and relatively minor administrative changes.

In closing, it is important to reiterate that urban agriculture must not be viewed and approached in isolation from other urban systems. Rather, it should be integrated into the municipal policy environment and urban fabric in a way that interlocks with current policies and contributes to existing municipal development objectives. In this way, a targeted and coordinated policy on urban agriculture can significantly improve the urban quality of life and ensure the city's vitality in spite of the challenges posed by climate change.

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Appendix A: Survey results

Section A: Growing food in Montréal: awareness and opinions

1.1 *Are you aware of fruits and vegetables being grown on the island of Montréal?*

Yes	31/49	63%
No	18/49	37%

1.2 *(If yes) Can you provide an example or two?*

Community gardens	16/49	33%
McGill rooftop garden	15/49	31%
Backyard gardens	12/49	24%
Action Comuniterre	1/49	2%
Rooftop gardens	1/49	2%

2.1 *Please respond to the following statement: 'Growing fruits and vegetables in the city is generally a good idea.'*

Strongly disagree	0/49	0%
Disagree	0/49	0%
Neutral	7/49	14%
Agree	10/49	20%
Strongly agree	32/49	65%

2.2 *Why or why not?*

JUST FEELS GOOD

feels good	good thing to do
relaxing	relaxing
exercise	pleasant activity
relaxing activity	fun

ENVIRONMENT

green	environmental
adds greenery	green space
environment	green is good for city
environmental	good for environment
ecology	

concerned about urban environmental quality

SUSTAINABLE

sustainable	small scale
eating seasonally	

SELF-SUFICIENCY & FOOD SECURITY

own food	personal self-sufficiency
own food	good to be self-sufficient
food security	don't have to go to store

LOCAL

local is better	good to grow locally
local	easy to distribute food
transportation	local

reemphasise local production

BEAUTIFUL

beauty	more colourful
aesthetic	invigorates the city

ECONOMIC REASONS

economical	easier access to produce
economical	readily available food
cheaper food	

economical way to procure food

HEALTHY EATING

safe	healthy
better nutrition	enjoy own tomatoes
yummy	better that supermarket
organic	not GMO
fresh food	better quality food
not industrial	

- nice to have fresh vegetables
- choice of how food is grown
- control over what one eats

COMMUNITY
- good for community
- community-oriented
- brings community together

AWARENESS & OPINIONS
- raise awareness
- awareness of consumption and energy use
- changes people's opinions about nature
- awareness about food source and transportation
- knowing where your food comes from
- knowing where your food comes from
- you know where your food comes from

REASONS AGAINST UA
- air pollution
- too many squirrels
- not the right place for fruits and vegetables
- space in city should be used for housing

3.1 *Please respond to the following statement: 'Using rooftops for growing food is generally a good idea.'*

Strongly disagree	0/48	0%
Disagree	2/48	4%
Neutral	6/48	13%
Agree	13/48	27%
Strongly agree	27/48	56%

3.2 *Why or why not?*

EFFICIENT USE OF SPACE
- good use of space
- good use of space
- good use of space
- good use of space
- good use of space
- good use of space
- good use of space
- efficient use of space
- using unused space
- convenient use of space
- logical
- efficient use of space
- makes use of underused areas
- recuperating unused space
- practical use of unused space
- does not take up extra space

ECOLOGICAL BENEFITS
- air quality
- improves air quality
- ecological
- ecology
- environmental
- environmental
- energy efficiency
- energy efficiency
- energy efficiency
- cools buildings
- adds greenery
- water retention

NATURAL & BEAUTIFUL
- connection to nature
- better that supermarket
- connection to nature
- beauty
- organic
- looks, smells and tastes good

RESERVATIONS
- windy
- if it's possible…
- if structurally sound
- seems weird
- hard to access
- depends on roof structure
- isn't it dangerous?
- concerns about acid rain
- concerned about weight
- concerns about structure
- not familiar with rooftop gardening
- no better than any other location

4. *Would you rather see a food garden or a hard-surface patio outside your workplace windows? (Explain that a decorative garden or lawn is not an option.)*

Food garden	44/49	90%
Hard-surface patio	1/49	2%
Could not decide	4/49	8%

5. *On which of these sites do you think fruits and vegetables should be grown in the city? (option to mark more than one)*

On underused parking lots	34/49	69%
In alleyways	22/49	45%
On rooftops	44/49	90%
On residential lawns and backyards	49/49	100%
On patios and balconies	45/49	92%
On university and CÉGEP campuses	45/49	92%
In school and daycare yards	38/49	78%
On hospital grounds	27/49	55%
Nowhere in the city	0/49	0%
Other:		
Wherever else space permits	2/49	4%
Parks	2/49	4%
Inside homes	1/49	2%
Not near highways	1/49	2%

6. *Please respond to the following statement: 'Gardening in the city enhances quality of life for city residents.'*

Strongly disagree	0/49	0%
Disagree	1/49	2%
Neutral	1/49	2%
Agree	12/49	25%
Strongly agree	35/49	71%

Section B: Awareness of the food garden at McGill

7.1 *Are you aware that there is a new gardening initiative on the lower McGill campus?*

Yes	30/49	61%
No	19/49	39%

7.2 *Do you know that fruits and vegetables are being grown there?*

Yes	26/49	53%
No	23/49	47%

7.3 *Are you aware that it's part of the Santropol-Roulant/Alternatives Rooftop Garden Project?*
(If no, offer to provide informational flyer at end of interview)

Yes	12/49	25%
No	37/49	75%

7.4 *How would you express your initial reaction to this food garden (in one or two words)?*

PLEASURE

I like it	green is nice
made me feel good	cool idea
different; nice	good idea
nice	really pretty
cooool	good, looks better
excellent	very beautiful
nice	what a space!
nice	nice, interesting
positive	beautiful, very nice
great	great work!

interesting
distinct from concrete, nice
positive, nice, worthwhile project
rather extraordinary; good idea
enhances beauty of the stairs
I like it a lot; very pleasant

compliments grey buildings
liked it; good use of space
I like it; adds to campus
looks nice, more alive
positive; good initiative

SURPRISE

wow — pleasantly surprised
curious — shocked (in a good way)
surprised, happy
wow, someone is using the space!

SUGGESTIONS

sign is too small — should be everywhere
should be planted in ground, not in boxes

OTHER

discreet — lacks aesthetics
Is it an experiment?
fine, nothing against it
thought it was a class project
good idea, but takes away from gathering area
Is it part of someone's thesis?
good idea, but looks thrown together

8.1 *This food garden should become a permanent feature on the McGill campus.*

Strongly disagree	0/48	0%
Disagree	0/48	0%
Neutral	4/48	8%
Agree	9/48	19%
Strongly agree	35/48	73%

8.2 *This food garden should be integrated into the curricula of relevant courses at McGill.*

Strongly disagree	0/48	0%
Disagree	1/48	2%
Neutral	7/48	15%
Agree	12/48	25%
Strongly agree	28/48	58%

8.3.1 *Similar food gardens should be introduced in other places in the city.*

Strongly disagree	0/49	0%
Disagree	0/49	0%
Neutral	1/49	2%
Agree	14/49	29%
Strongly agree	34/49	69%

8.3.2 *(If yes to 8.3.1) Where in particular? (Prompt respondent to identify a specific site or type of place)*

TYPES OF AREAS

vacant lots	parks
empty spaces and walls	parks
vacant land	parks
vacant concrete	parks
unused lots	parks
empty concrete	parks
vacant lots	universities
CEGEP and universities	other campuses
university campuses	other campuses
teaching institutions	other campuses
all school areas	grade schools
schools	hospitals
hospitals	hospitals
rooftops	roofs of buildings
rooftops downtown	residence homes

everywhere everywhere
apartment complexes parking lots
community gardens
outside government buildings
median between car lanes on road
where most visible; gov't should subsidise

NEIGHBOURHOODS
McGill ghetto poor neighbourhoods
around McGill downtown core
low-income neighbourhoods
by the canal; flowers and vegetables side by side

SPECIFIC PLACES
Place des Arts near Mont-Royal
8th floor of the building where I work

Section C: The roles of different actors in urban agriculture

.

9.1 *Public buildings (schools, libraries, etc.) should have food gardens on their grounds.*

Strongly disagree	0/47	0%
Disagree	0/47	0%
Neutral	13/47	28%
Agree	9/47	19%
Strongly agree	25/47	53%

9.2 *Food-gardening activities should be integrated into the school, CÉGEP, and university curricula.*

Strongly disagree	1/47	2%
Disagree	1/47	2%
Neutral	7/47	15%
Agree	11/47	23%
Strongly agree	27/47	58%

10. What role should be played by the following actors with respect to growing food in the city? Mark cells with an X as appropriate: Discourage, Oversee, Promote, Play no role (More than 1 choice is acceptable)

10.1 *Local government*

Promote	42/49	86%
Oversee	8/49	16%
Play no role	2/49	4%

10.2 *Éco-Quartiers*

Promote	38/46	83%
Oversee	12/46	26%
Play no role	1/46	2%

10.3 *NGOs / community organisations*

Promote	40/44	91%
Oversee	7/44	16%
Play no role	1/44	2%

10.4 *School boards*

Promote	34/45	76%
Oversee	4/45	9%
Play no role	8/45	18%

Section D: Behaviour

11.1 *Do you grow fruits or vegetables in the city?*

Yes	13/48	27%
No	35/48	73%

11.2 *(If no to 11.1) Why or why not?*

WHY

pleasant; eat what I produce
provides pastime, relaxation, fresh food
enjoy it; tastes good; cheap
fun to learn how to grow own food
it's fun
don't have to rely on stores; healthier

WHY NOT

no space	no time, space or interest
no space	prefer flowers
no space	no time, no space
no space	cold winters, no space
no space	never occurred to me
no space	no need
no space	no time
no space	no time
no space	lazy
no space	too much trouble
no space	I don't know how
no space	no space

no space; don't know how
never thought it could be done in the city
not necessary; more interested in music
lack of interest and skills
little space for bigger growing operation
no garden; don't want one
wildlife eats produce

12.1 *Do you eat fruits or vegetables that are grown in the city?*

Yes	19/48	40%
No	13/48	27%
Don't know	16/48	33%

12.2 *(If no to 12.1) Would you eat fruits and vegetables grown in the city?*

Yes	27/29	93%
No	2/29	7%

13.1 *Given an easy and affordable option to garden in the city, would you do it?*

Yes	30/48	63%
No	10/48	21%
Don't know	8/48	16%

13.2. *Do you have concerns about growing fruits and vegetables in the city?*

None	9/49	18%
Air pollution harms the quality of the produce	26/49	53%
Soil contamination harms the quality of the produce	23/49	47%
Takes up valuable land in the city	1/49	2%
It is visually unappealing	1/49	2%
Theft	12/49	25%
Vandalism	16/49	33%

Others:

Animals	Acid rain
Homeless people	Should be well cared for

Choose locations and materials wisely

Section E: Respondent profile

14. *Do you have any affiliation with McGill University?*

Student	21/49	43%
Professor/Instructor	2/49	4%
Other Staff	3/49	6%
No affiliation	23/49	47%

15. *What is your occupation?*

ACADEMIC
- Math & philosophy
- Geologist
- International politics
- Eastern religions, professional writing
- Public policy & geography
- Management
- Atmospheric science
- PhD in math at UQAM
- PhD Islamic studies
- PhD in math
- History and philosophy
- Law
- Haptics researcher
- Nursing
- Nursing
- Engineering
- Mechanical engineering

PROFESSIONAL
- Retired psychologist & councillor
- Security
- Accountant
- Musician
- Musician
- Nurse manager
- IT project manager
- IT project manager
- Canoe rental specialist
- Freelance journalist
- Computer scientist
- Personal trainer
- Tree planter
- Freelance researcher
- Secretary
- Bank teller

16. *Please state the first three digits of your home postal code.*

H1X	H2X	H3A	J5R
H2G	H2X	H3C	Outside Canada
H2H	H2X	H3E	Outside Canada
H2H	H2X	H3J	Outside Canada
H2J	H2X	H3K	Outside Canada
H2J	H2X	H3N	Outside Canada
H2J	H2Y	H4L	Outside Canada
H2S	H2Z	H4V	Outside Canada
H2S	H3A	I3N	Outside Canada
H2T	H3A	J0P	Outside Canada
H2W	H3A	J4R	Outside Canada
H2W	H3A	J5R	Outside Canada

17.1 *Respondent's gender:*

Female	21/49	43%
Male	28/49	57%

17.2 *Respondent's approximate age:*

Child or teenager	3/49	6%
Young adult (20-40)	40/49	82%
Middle-aged (40-65)	5/49	10%
Senior / retiree	1/49	2%

Le jardin du Roulant

The Edible Campus

Des jardins sur les toits
de nouveaux espaces pour la communauté

The Rooftop Garden Project
liberating spaces for healthy cities

Le jardin du Roulant

Le jardin du Roulant est le fruit d'un partenariat innovateur entre l'école d'architecture de l'Université McGill et le projet Des jardins sur les toits d'Alternatives et du Santropol Roulant. Ensemble, nous explorons des façons d'augmenter la production alimentaire dans des espaces urbains sous-utilisés comme les toits, les balcons et les espaces minéralisés qui sont fréquents à Montréal et dans d'autres centres urbains.
Ce jardin sert de model aux citadins qui désirent produire leurs propres légumes, verdir leurs quartiers et cultiver de nouvelles relations au sein de leurs communautés.

Où va la production maraîchère?

Tous les produits de ce jardin alimentent la cuisine de la popote roulante du Santropol Roulant. Ils sont transformés et distribués à des personnes avec une perte d'autonomie.

Comment s'impliquer ?

Le jardin sera ouvert entre le 22 mai et début octobre 2007.

Horaires de jardinage et ateliers ouverts à tous:
Le mardi, de 9h30 à 12h30
Le jeudi, de 16h00 à 19h00
Le samedi, de 9h30 à 12h30

Téléphone : (514) 286-5115
Courriel: jardin@santropolroulant.org
Site Web : www.lesjardins.ca
(Veuillez vous rendre régulièrement au site web pour connaître les changements d'horaires).

Pour plus d'informations sur le projet Making the Edible Landscape et sur des initatives en agriculture urbaine menés par le Minimum Cost Housing Group de l'école d'architecture de l'Université McGill, visitez : www.mcgill.ca/mchg/

The Edible Campus

The team of volunteers and researchers from Rooftop Garden Project of Alternatives, Santropol Roulant and McGill School of Architecture's Minimum Cost Housing Group has created this garden. Together, we are exploring ways to increase food production in cities, particularly in under-used urban spaces such as rooftops, balconies and paved areas, commonly found in Montréal and other urban centres.
The Edible Campus is a model garden to help ordinary people produce their own vegetables, green their neighbourhoods and build healthy communities.

Where does all of the food go?

All of the produce from the Edible Campus goes to the meals--on-wheels kitchen of Santropol Roulant. It is transformed and distributed to people with a loss of autonomy.

How to get involved?

The garden will be open from May 22 to early October

Gardening schedule and public workshops:
Tuesdays : 9:30am - 12:30pm
Thursdays: 4:00pm - 7:00pm
Saturdays: 9:30am - 12:30pm

Telephone: (514) 286-5115
Email: jardin@santropolroulant.org
Web Site: www.rooftopgardens.ca
(Please check the website regularly for updates and schedule changes)

To learn more about Making the Edible Landscape project and urban agriculture initiatives please visit the website of McGill School of Architecture's Minimum Cost Housing Group at: www.mcgill.ca/mchg/

Merci de respecter les lieux

Thank you for respecting the garden

Alternatives
... pour un monde différent

Santropol roulant

McGill

Source: Leila Farah, McGill University