Urban Cultural Greenways: The Potential of Urban Agriculture as Sustainable Urban Infrastructure

GUNDULA PROKSCH
University of Washington

DANIEL ROEHR
University of British Columbia

INTRODUCTION

Deserted parks, maintenance intensive lawns, vacant boulevards, over-sized road medians and dog-walkers turf shape the image of contemporary green spaces in North American cities. The large number of under-utilized green spaces is the starting point for re-thinking urban public green space, as an active, social urban infrastructure. Urban greenways, often developed based on formal principles of 'parkways', have lost the original intention of the early parkways to also improve social, health and engineering issues in cities of the late 19th Century. Today developments still follow the same formal principles without design integration of sustainable practices to foster social equity, environmental health, and economic prosperity in communities. On the contrary, these open spaces often show very poor environmental and ecological performance when compared with current international standards, and usually offer little communal value for the residents but cause high maintenance costs for municipalities.

This dilemma offers a great opportunity for landscape architects, architects and urban planners to transform the existing under-utilized greenways into new hybridized landscapes providing multifaceted infrastructure. Urban cultural greenways are created by overlaying the existing green spaces with interactive, sustain-able programs, which are latent in the community. Depending on the city, the

Figure 1: Ottawa Gardens, City of North Vancouver

local conditions of the greenway and interests within the community, different types of greenways can be developed. Programs can range from visual art and architecture, history, performances and temporary events to urban agriculture[1].

The main idea of cultural greenways is that their interventions concentrate on one programmatic theme present within the city to further strengthen community identity and cohesion. The so enriched greenway can even become a figurehead for the city to distinguish and market itself. A re-activated greenway also stimulates the development and viability of adjacent neighborhoods. Throughout her career, Jane Jacobs emphasized the importance of

locating popular facilities along park edges to attract a diversity of users and tie the park together with its surroundings.[2] Strong connections between new programs and the existing neighborhoods and infrastructural systems are an important goal of this strategy. For residents, the greatest value of an active urban greenway is its accessibility and potential for every day use. It brings resources to those who would otherwise have no access, connecting them to the local environment and cultural programs.

This article investigates the integration of urban agriculture in existing urban greenways and uses the City of North Vancouver, BC as case study. The incorporation of urban agriculture as a strategy to create more ecologically, socially, and economically sustainable cities has largely been overlooked[3], therefore, the versatility of agricultural programs and their multifaceted contribution to the urban infrastructure will be examined. The City of North Vancouver, a waterfront municipality located in British Columbia, Canada, on the north shore of the Burrard Inlet, directly across from downtown Vancouver, lends itself to this investigation, because it is taking active steps to integrate urban agriculture within its municipal area. With a strong community support for urban agriculture projects and interventions, a pilot project for professional urban agriculture is currently undergoing the public approval process and is anticipated to be constructed in summer 2010 on a property provided by the City of North Vancouver. The pilot project can be seen as a seed and model for the transformation of parkland into farmland. Although this paper includes some of the experiences made in the development process of the pilot project, it focuses on projecting the integration of urban agriculture into the existing greenways on the larger urban and infrastructural scale.

URBAN AGRICULTURE IN VANCOUVER

Metro Vancouver has long been on the forefront of developing urban agriculture projects. It is also internationally recognized for progressive urban planning and commitment to sustainability, with the creation of the Special Office for the Environment (SOE), the Sustainability Region Initiative (SRI) as well as the Agricultural Land Reserve (ALR). What began mainly as a response to environmental issues has over time expanded to include social and economic aspects of sustainability. In April 2002, the Vancouver City Council defined sustainability as "achieved through community participation and the reconciliation of short and long term economic, social and ecological well-being."[4]

On December 11, 2003, the Vancouver City Council approved a Food Action Plan for creating a sustainable food system for the City of Vancouver. Shortly afterwards, City Council created the Vancouver Food Policy Council (VFPC) to examine Vancouver's local food system and provide policy recommendations. In 2006, the Vancouver city council passed a motion to encourage the creation of 2,010 new garden plots by Jan. 1, 2010, in order to create a legacy for the Vancouver 2010 Winter Games.[5]

In response to the new initiative, the Urban Agriculture Advisory Group was formed to review proposals on community garden guidelines and provide a support network for all community gardeners and urban food growers in the city. The organization has since been renamed Vancouver Urban Agriculture Network (VUAN). Today, there are more than 1,800 plots in more than 40 gardens spread across Vancouver.[6] The Vancouver Park Board also recognizes community gardening as a valuable recreational activity. In 2004, the Park Board passed a motion to explore the planting of fruit trees on green spaces next to streets, community gardens and public parks to foster community development, environmental education and social benefits. [7]

A recent trend has seen a strong interest of Metro Vancouver municipalities to incorporate professional urban agriculture into their jurisdictions. The City of North Vancouver's pilot project will be part of an existing network of urban agricultural projects, such as community gardens or non-profit organizations, which help support food production within the community. Two of the main organizations are the Lower Lonsdale Community Gardens, containing nearly 50 garden plots maintained by nearby residents,[8] and the Edible Garden Project, which strives to create a network of communities where locally grown food on private land is collected and redistributed to organizations that provide food to low-income families and individuals.[9]

THE GREEN NECKLACE

Most of the urban parks and open spaces in the City of North Vancouver were laid out in the original 1907 town plan. As an urban centerpiece, the

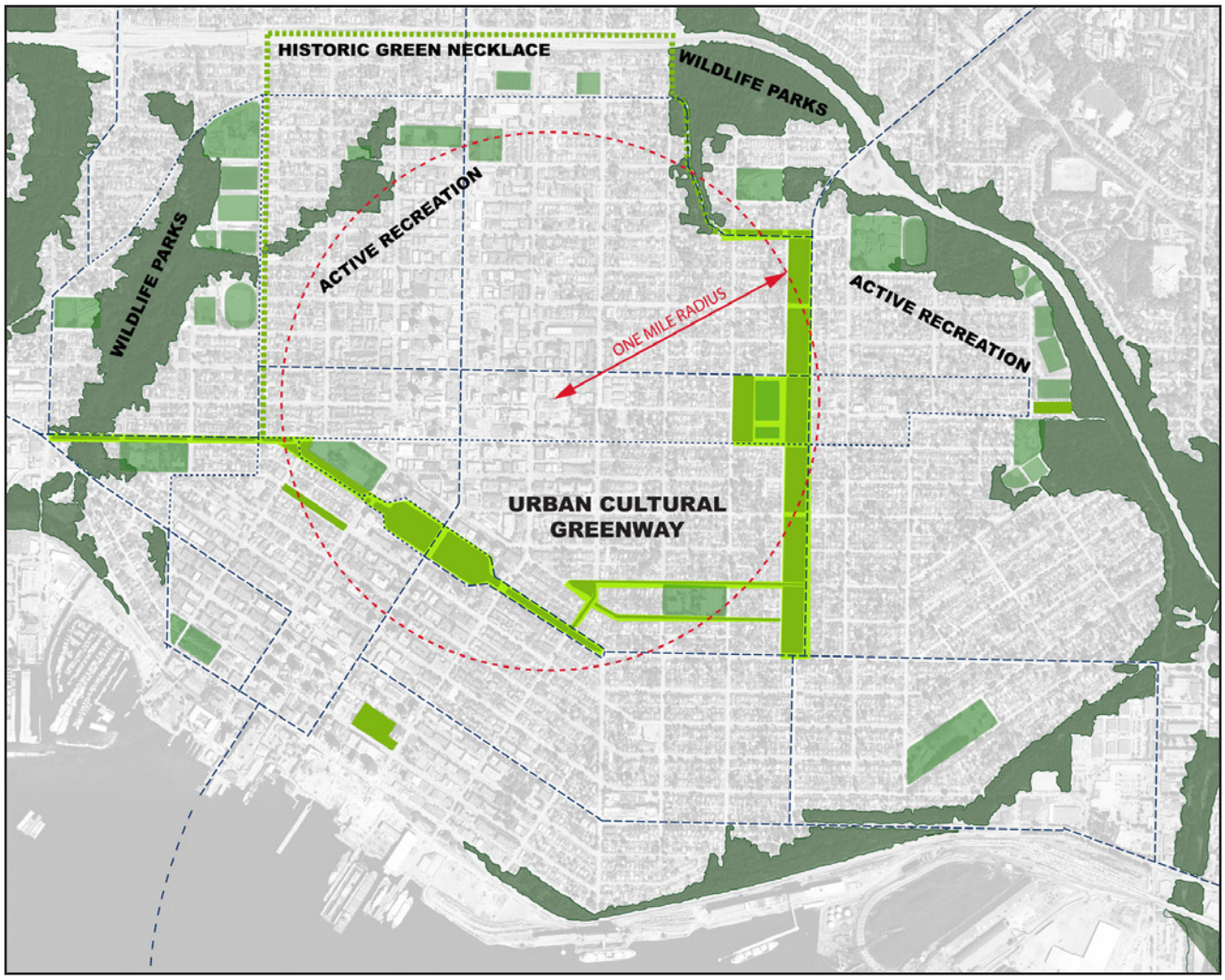

Figure 2: Park Systems in the City of North Vancouver

plan envisioned a *Green Necklace*, a ring of linked "parks within the street system", which was intended to surround the central square mile of the city. Today the complete ring no longer exists; the Northern part of the 'Green Necklace' was replaced by a highway in 1961. The two remaining parts are the southern rim, consisting of 50 - 150' wide boulevards, and a linear park on the west side, extending across 12 city blocks in North-South direction. These extensive green spaces with trails for pedestrian and bicycle traffic are currently under-utilized by residents but require intensive maintenance for the up-keep of formal horticultural gardens parts.

These portions of the Green Necklace are ideal sites for urban agriculture, as they are situated on south-facing slopes and benefit from sunlight all day long. Their location in the urban grid allows pedestrian accessibility for most residents and utility access, if required, for agricultural programs. The high edge-to-interior-ratio of the greenways and their narrow depth make it difficult to develop them for other programs, as their current condition shows, but predestines them for a sequence of growing fields needed for agricultural programs. Transformed into a cultural greenway the Green Necklace complements the diversity of park systems in North Vancouver. The city territory provides a series of wildlife parks along ravines as well as a variety of green spaces programmed mainly with playing fields and other active recreation programs. [Figure 2]

URBAN CULTURAL GREENWAY

To create an urban cultural greenway, this study proposes to infuse selected linear urban parks in the City of North Vancouver with urban agriculture programs, while maintaining and upgrading all existing programs and public pathways. The proposed programs vary in scale and intensity; they include allotment, community and demonstration gardens, edible schoolyards, urban orchards, edible landscaping, food composting, local farmers markets and small-scale professional urban farming. All proposed programs are conceived as environmentally, socially and economically self-sustaining systems and are accessible to the public.

It is the City of North Vancouver's intention to develop a master plan in collaboration with community groups once results of the pilot project have been gathered. The planning and development process will build on the results of the pilot project. In the long run, it will generate policies, which promote urban agriculture as an integral part of the urban planning and permission process. During the public approval process for a city wide cultural green way plan, local initiatives, non-profit organizations and other stakeholders take on the stewardship for sites on city owned land. In turn, community groups are responsible for the implementation of site improvements and infrastructure as well as the maintenance of the site. The city offers approximately 37 acres of green spaces suitable for urban agriculture. The size of the individual plots will be based on the programs proposed by community groups or private enterprises[11]. The involvement of the community in the planning and maintenance of cultural greenways creates a sense of social responsibility and gives the residents an opportunity to engage in the complex relationships among politics, culture and the local living environment.[12] Through the allocation of sites to communal, charitable or private stakeholders, the city can reduce the maintenance cost for its green spaces.

The master plan will include design principles for the physical characteristics and pattern of use[13], which will generate a consistency between the different sites and programs in the linear parks. The structures of agricultural cultivation, from growing beds and planting grid, guided by a maximization of sun exposure and minimization of erosion during storm water events, to the reoccurrence of elements like greenhouses, hedges and espaliers, will heighten the existing topographical conditions, create an armature for the seasonally changing vegetation and generate the esthetics of a working landscape.

This approach intends to reveal and expose agricultural and environmental processes, as well as create strong experiences for the public. Elizabeth Meyer highlights the importance of participatory experiences to engage visitors and to connect them to environmental and cultural processes. She further argues for an intersection of ecological cycles with social routines and spatial practices[14]. Therefore, important pedestrian connections along and through the new farming sites are maintained and developed. Additional programs, like outdoor classrooms, picnic areas, and playgrounds create destinations within the linear park which draw people in and through the new greenway and make it part of their everyday life.

COMMUNITY VERSUS ENTREPRENEURIAL

Two types of urban agriculture are envisioned for the cultural greenway; firstly, programs which are managed by the community and non-profit organizations and secondly, entrepreneurial urban agriculture ventures. Community-related urban agriculture includes programs like allotment, community and demonstration gardens, urban orchards and edible landscaping in the city. These programs feature either the common cultivation of land or divide land into plots, which are then allocated to individuals to grow produce for their own consumption. Their benefit lies in creation of community, social gathering, education and individual food production, part of which is in some cases donated to food banks, i.e. the Edible Garden project.

The integration of professional and entrepreneurial farming activities has the potential to generate more viable cultural greenways. An infrastructure of professional urban agricultural enterprises can pursue a produce palette based on high yields and value and market local organic food to a whole neighborhood. While attempting to gain a profit, the aim is to maintain a strong social agenda by creating local jobs and provide community programs with an emphasis on professional agriculture education, job training and rehabilitation. Precise strategies for the development and funding of these programs and jobs are beyond the scope of this paper, but

the integration of urban agriculture can generate two types of jobs, permanent and seasonal trainee positions. The permanent jobs are year round commitments with only a short downtime in the winter, due to the mild climate in the region. The winter months are used for management, public relations, marketing, continued education, teaching opportunities and most importantly to plan and organize the next growing season. In addition, trainee programs are intended to offer special job training and (re)integration programs to the larger community, similar to the Wood Street Urban Farm. This farm, located on the South side of Chicago, operates a transitional employment program for individuals who have been previously incarcerated and homeless. The urban farm offers participants with employment barriers an integration opportunity through a seven monhs employment to gain self-confidence and personal development. Throughout these seven months, participants are trained in organic farming, nutrition education, sales and marketing, and also basic life skills. Through the partnership with a local college, the participants have the opportunity to take free general education development courses which prepare them to enter college or other training programs. [15]

URBAN AGRICULTURE PILOT

The Urban Agriculture Pilot, currently under development, is a pilot project for the development of entrepreneurial, professional urban agriculture and could be the first building block of its kind in the

Figure 3: Urban Agriculture Pilot for The City of North Vancouver

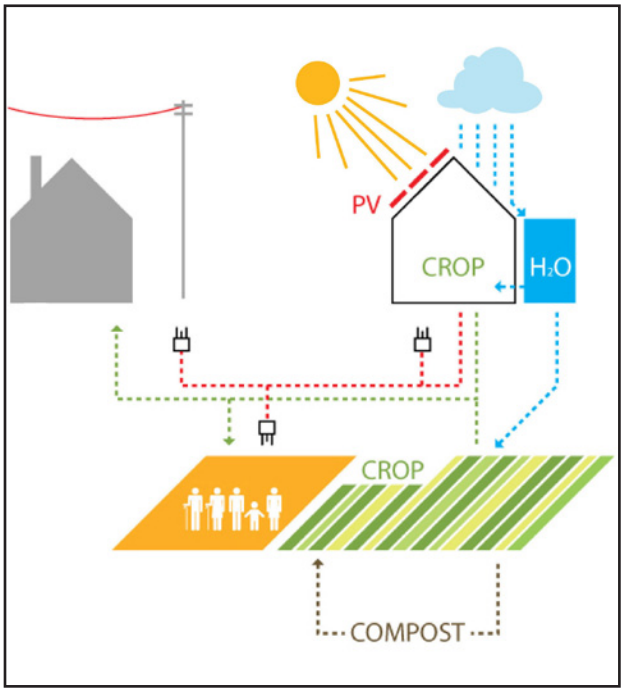

Figure 4: Urban Agriculture Pilot: Sustainable Cycle

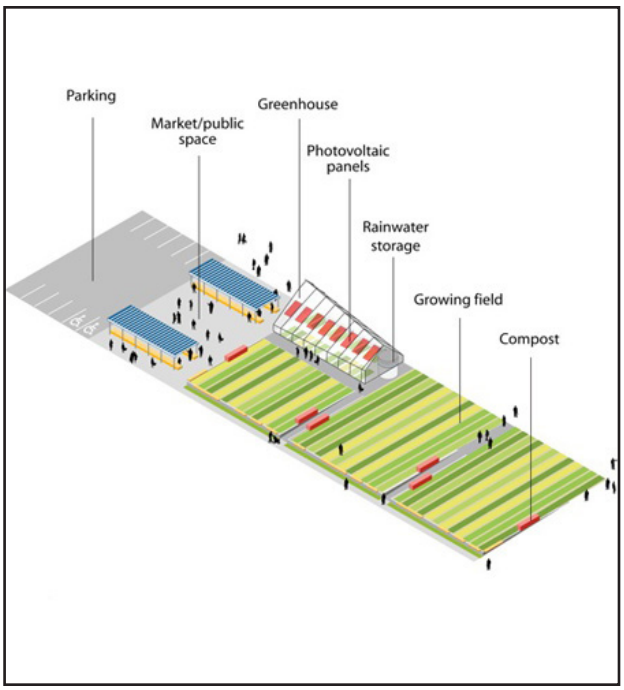

Figure 5: Urban Agriculture Pilot

City of North Vancouver. The project is conceived to advance knowledge about sustainable agriculture production on urban sites, while meeting specific environmental, economic and social goals. It will showcase the integration of environmental systems such as a closed hydrological cycle, a balanced nutrient cycle and the production of renewable energy, within a research station for professional urban farming. Through this pilot project best growing conditions and agricultural practices within the city are tested to increase crop yields. A combination of outdoor growing fields and green houses will be used to extend the growing season in a sustainable way as well as provide passive solar energy and rainwater collection. Rainwater will be harvested on greenhouse roofs, stored and used for irrigation in the low precipitation summer months, which coincide with the main growing season. Electricity will be generated by building photovoltaic technology into the greenhouse roofs to cover the energy needs on site and create a self-supported system. Excess energy production will be fed back into the grid, eventually decentralizing energy production. [Figure 4]

Professional projects require a more substantial initial investment for technology, infrastructure and staff. For the pilot project, a group of MBA students at the University of British Columbia's Sauder School of Business, is currently elaborating a socially responsible business plan to create a framework for running the farm in a self-sufficient way whilst allowing for training, integration and socialization programs.

Similar entrepreneurial urban agriculture programs have already been established. The Kansas City Center for Urban Agriculture (KCCUP) promotes urban farming with community-based programs, as well as entrepreneurial urban agriculture. As part of the organization, the Kansas City Community Farm, a financially self-sustaining demonstration farm, produces over 30,000 pounds of certified organic vegetables each year on 2.25 acres of land. The farm's production and management are showcased and shared to provide an educational tool as well as knowledge exchange between agricultural professionals, local farmers, school groups, and members of the community

Local farmer's markets are part of the entrepreneurial strategies of the cultural greenway, but could be run by either community or professional groups. Markets are located in accessible areas and visible intersections to expand the availability

of fresh, organic produce. They serve as a direct outlet for the produce harvested on the cultural greenway. The creation of a network of markets and vendors would begin to decentralize the food distribution within the City of North Vancouver. This will help to make the city more walkable and pedestrian friendly in addition to providing residents with access to healthy, affordable food.

IMPACT ON EXISTING INFRASTRUCTURE

The creation of a cultural urban greenway through the implementation of a diversity of urban agriculture programs can help the development towards a more sustainable city. Urban agriculture interventions expand and remediate existing infrastructure by enhancing their environmental and economic performance, by lightening the load on this infrastructure and by introducing more ecological, sustainable systems. Undoubtedly, urban agriculture brings a wide range of social benefits to its citizens who engage in the programs.

SOCIAL BENEFITS: EDUCATION AND INTEGRATION

Through their unique physical accessibility cultural greenways offer access to a wide range of people. They can provide opportunities for informal education to residents who wander through the green space on regular basis as well as formal educa-

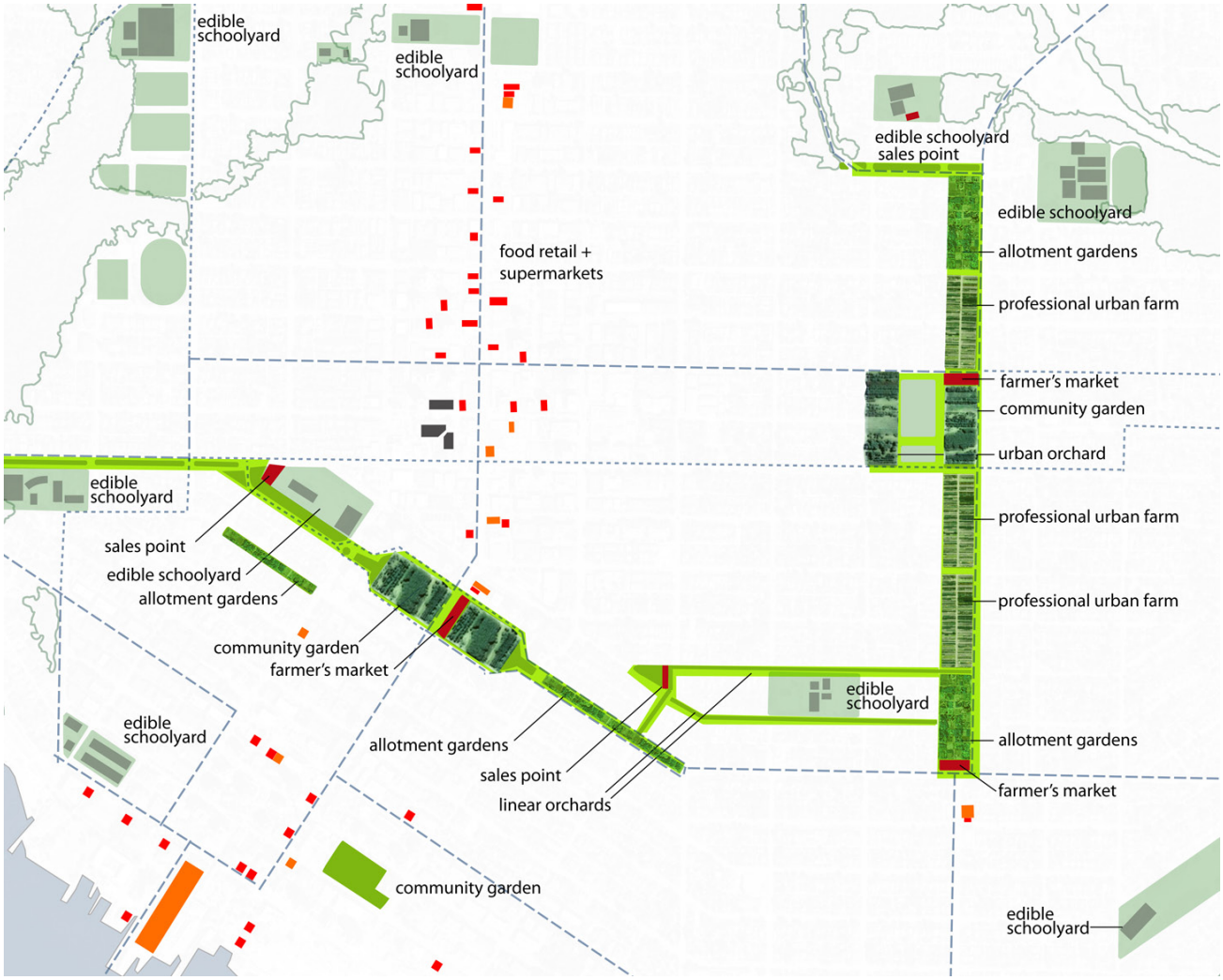

Figure 6: Urban Cultural Greenway and Edible Schoolyards

tion to others who engage in specific programs or voluntary work. The primary goal of both forms of education is to reconnect the population with local food production and to create environmental awareness, for example by supporting seasonal food consumption. People learn what fruits and vegetables grow in season through observing growing areas and farmer's market sales. Formal courses offer education in farming to extend one's own back yard food production and to learn about sustainable water management, spreading these practices across the entire city. Research indicates that emotional and affective learning through experience and engagement is at least as important as factual knowledge in cultivating environmental awareness and sustaining a cultural legacy of producing and consuming food.[17]

These efforts can be extended in specific school and youth programs, by providing schoolyard urban agriculture programs. The Edible Schoolyard in Berkeley became a model for such an integrated education. The one-acre organic garden educates and reconnects students to the natural world, by introducing them to environmental and social issues. In the kitchen classroom, children learn how to grow and prepare the food that they eat, while learning about biology, chemistry, and history.[18] The Dunbar Garden Project (DGP) in Little Rock, AR also functions as an outdoor classroom, providing education for school children, teenagers, and adults.[19] Such programs can develop into a network of urban agriculture initiatives, including schoolyards and connecting school activities to the urban 'cultural' and 'social' landscape.

Reaching children and youth is particularly important, since they will be future stewards for the environment and food production. Intergenerational projects like the Food Project in Boston provide youth and adults alike with the opportunity of acquiring new skills in sustainable food production. The central aim of the Food Project is to empower at risk youth by offering leadership roles within the organization. These roles serve as a gateway into both formal and informal education opportunities; the youth are in turn prepared for other leadership roles within their communities.[20]

Urban farms strengthen urban communities by fostering neighborhood creation and community identification as well as generating local economic growth through integration, socialization and job creation, in particular for groups that are otherwise disadvantaged, as the example of the Wood Street Urban Farm in Chicago shows. Added Value, a nonprofit organization, which runs the Red Hook Community Garden in South Brooklyn, works directly with youth who had been in juvenile detention facilities. The program fosters the development of new skills in urban farming but also of a new perspective on one's life. The ReVision Urban Agriculture Project, located in Dorchester, Massachusetts, is part of a shelter for young homeless women and their children, which provides job training and education for its residents and interns.[21]

While local food production generates better access to organic food in general, it also increases food security and allows for the distribution of food to people in need. Foodshare is Canada's largest community food security organization. The nonprofit organization focuses on the entire food system, from growing and processing to distribution and consumption of food. Founded by Annex Organics, The Field to Table Urban Agriculture Project grows food in underutilized spaces within Toronto. The project increases food security by improving the city's food self-reliance by reducing the dependency on long distance food imports. Through a variety of community projects, Foodshare reaches over 100,000 children and adults a month through subsidized distribution of fresh produce, nutrition programs, classroom curriculum support, and youth internships. The project not only allows food distribution to people in need but also increases public awareness and civic responsibility in this issue and generates social equity. [22]

ENVIRONMENTAL BENEFITS

The implementation of urban farming bears the potential to increase the environmental performance of urban parks in cities. The success of this endeavor largely depends on the choice of farming techniques and integral design elements; primarily, through the adaptation of urban agriculture sites to local climate. In the Vancouver region rainwater harvesting during the wet winter months can provide a large amount of the water necessary for crop irrigation during the four predominantly dry summer months. The additional integration of rain gardens, disconnected from the irrigation water,[23] supports the storm water management of adjacent

streets. The creation of a more sustainable water cycle has a large impact on the urban infrastructure. It reduces the dependency on public water and the volume of storm water in the combined sewer, which conserves water resources and energy needed for wastewater treatment.

Urban agriculture is often a vanguard for the integration of alternative, self-sufficient energy systems and consequently, a decentralization of the energy production. For example, the Wood Street Urban Farm is currently expanding the production of renewable energy. Future plans include the construction of a solar panel "power tower" to provide energy for the site.[24] The initial impact on the city's energy balance might be small, but will be soon multiplied through the education of residents and their increased acceptance.

A substantial benefit of urban agriculture results from the reduction of food miles and therefore embodied energy and CO^2 emissions[25]. Along with a decentralization of the food distribution and sales through local farmers markets, Community-Supported Agriculture (CSA) and food co-ops[26], it relieves the traffic infrastructure and makes the city more pedestrian friendly.

On an ecological level, local food production fosters crop diversity, preserves heirloom crops that are adapted to the regional climate and increases availability of organic produce. The ReVision Urban Agriculture Project practices environmentally sustainable farming methods including composting, crop rotation and succession planting.[27] Their environment friendly agriculture practices result in an improvement of biodiversity of animal and plant life.

ECONOMIC BENEFITS

Building on all "three pillars" of sustainability[28], economic strategies are an essential part of approaching the implementation of cultural greenways. The introduction of urban agriculture adds another economic layer and generates a local market. Community groups, non-profit organizations and entrepreneurs who take over stewardship for urban agriculture sites should strive to run their projects cost effectively to establish self-sufficient systems. Cities can support this by providing the land free of charge, in return they will benefit from the relatively low investment costs of urban agriculture in comparison to conventional infrastructure and a reduction of their parks maintenance costs.

Entrepreneurial urban agriculture invests in job creation, job training and integration programs. This offers support to residents, particularly the disadvantaged or otherwise vulnerable in the labor market. Profits and salaries are reinvested in the local market; this makes the community less dependent on outside sources[29]. Urban agriculture provides safe nutritious food to the community and helps increase social equity with additional food supplies for residents in need; this reduces costs for social welfare and health care. A good example for the successful integration of economic considerations within an urban agriculture project is Growing Power in Milwaukee. Its main facility functions as a prototype for Community Food Centers where schools, universities, government agencies, farmers, activists, and community members are educated using sustainable practices to grow, process, market, and distribute food.[30]

An additional economic stimulus through an increase in real estate value may also be triggered by the revitalization of existing greenways. The development of real estate values in relation to the implementation of urban agriculture sites is a little researched economic effect. A study by New York University School of Law estimates the impact of community gardens on neighborhood property values using data from New York City. The study finds that on average community gardens have significant positive effects on surrounding property values especially in low-income neighborhoods. In some cases, raising neighboring property values by 9.4 percent within five years of the garden's opening.[31] In particular, the revitalization of low-income neighborhoods by means of community gardens and other urban agriculture projects can add to the positive and marketable image of a city as a whole. Consequently, it enhances the reputation of a city in terms of overall sustainability, livability and as an ideal location for new progressive businesses and investments.

CONCLUSION

Under-used urban parkways transformed into agricultural greenways strive to create an "active", self-sustaining instead of a "passive", cost-intensive public green infrastructure, be it a community gar-

den or entrepreneurial urban agriculture project. The positive environmental effects of this new type of infrastructure are evident, but due to the relatively small amount of urban agricultural projects implemented thus far, these have not been measured or researched in depth. Investigations of this important aspect of urban agriculture have to be continued, while the educational benefits of even small interventions for the community should be further promoted. The active engagement of residents or passers-by creates awareness about the local environment and food production through emotional and affective, as well as cognitive learning. It fosters community identity and social cohesion. The social role of urban agriculture can impact the community not only by these multifaceted educational and cultural benefits, but also by community building and integration, and a broader economic stimulus. It carries the ability to reach all members of a community in a unique way - from children to the elderly. The creation of community engagement through experience is the central goal of a cultural urban landscape. As Elizabeth Meyer notes, "experiences are vehicles for connecting with, and caring for, the world around us"[32], therefore the experience of urban agriculture programs and resulting awareness has the single most impact and is necessary to induce the described positive transformations.

ENDNOTES

1. Many cities have started to re-activate their parks and greenways. Philadelphia has created a cultural parkway, an urban art landscape, linking its downtown and its main cultural buildings. Temporary events and festivals are more commonly found as a strategy to activate greenways, like the Boulder Creek Festival. On a larger scale re-establishing greenway systems is an ideal approach to increase the urban core's environmental, social and cultural value. Boston's Rose Fitzgerald Kennedy Greenway has been enrich through urban agriculture interventions.

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