

Food and Urban Design: Urban Agriculture as *Second Nature?*

KATRIN BOHN AND ANDRÉ VILJOEN

It is generally accepted that the establishment of settled agriculture enabled the formation of cities; the relationship between the two is intimate and very old. Until the nineteenth century, cities like Berlin and London had extensive areas of market garden within and around their urban centers. And today in China, for example, food is still grown within older cities. However, what was once everyday practice has become a stranger to many cities, to the extent that urban design and planning researchers have fairly recently defined a new term for food-growing practices linked to city space: urban agriculture.

Undeniably, during the last twenty or so years, urban agriculture (also called “urban farming”) has once again become an increasingly common feature of many urban areas in the Global North—responding to social, environmental and economic concerns—and has long been practiced in the Global South. The practice of urban agriculture during these past decades is remarkable and, across the world, has entered the open spaces of many cities or attached itself to their buildings. The vast majority of urban farmers produce fruit, herbs, mushrooms and vegetables, and often farm using organic principles. There is also an international upsurge of interest in water-based systems, for example “aquaponics” combining traditional fish farming with contemporary hydroponics. Urban agriculture is now widely understood as a movement and as an urban space-use typology.

But there is a paradox: while China, to stay with the example, modernizes and urbanizes, eliminating its urban food growing, in New York, at the same time, space is being sought to re-establish urban agriculture. In both situations, the proponents of change believe they are creating desirable cities for the future in response to the needs of their respective populations. Often they polarize public opinion on the subject of urban food provision instead of leading to a common understanding of what urban design and development should and could do to cities around the world. Both situations exist in their own concrete local reality, but the big, common reality may be that we are witnessing a rebalancing of the relationships between cities and agriculture, between the urban and the rural. Boundaries blur, not only spatially, but also in terms of popular perceptions of urban culture and individual habit and of concepts regarding the possibilities from food production to its consumption.

What is motivating the appearance of urban agriculture? Is it a response to crisis? To an extent, it is: in modernizing/developing societies, urban agriculture has often been seen as a response to food scarcity and emergency as evidenced by Cuba's pioneering introduction of intensive urban food growing after the collapse of its economy during the late 1980s. However, more recently urban agriculture is also being recognized as a way of *preventing* scarcity, for example, by introducing closed-loop no-waste cultivation systems into cities, while reducing food miles and providing heat island mitigation, visual amenity, public health, and educational benefits—all in all, environmental motives supporting sustainable urban development.

Another interesting notion is the relation of individuals to foodstuffs, be they fresh plants or processed products, evidenced in the ever-rising appetite for “the home-grown” and “the home-made.” With its often stated intention to render urban lives more meaningful and connected, urban agriculture does purport to address another type of “scarcity” connected to urban lifestyles, desires, and food cultures. Here, urban agriculture can help to create *abundance*—physical, such as in terms of yield and space, as well as social, for example in terms of employment and access to quality food. On the other hand, many of the food-producing examples we may refer to are used as tools for urban regeneration or connected to privileged markets, either selling expensive products to a few or being thought up by affluent urbanites to “better” less-lucky neighborhoods, or both.

In this complex web of environmental, social, economic, and cultural conditions, what role does design play? How do urban and architectural design influence urban food production and the other way around? And what role plays popular culture in shaping this popular subject, or is the subject being shaped by popular culture? Or both?

WHAT IS URBAN AGRICULTURE?

It was probably simply the stark contrast between the words “urban” and “agriculture” that triggered the imagination of those who created the term “urban agriculture” twenty years ago and sent it out to the world with both a question mark and an exclamation mark. Since that time, stakeholders in many countries have appropriated “urban agriculture” for use in their own specific contexts. However, what is common to all these understandings is the recognition that “urban agriculture” expresses the duality of a spatial adjacency—the urban and the field (“agri”)—and of a direct action, to grow (“culture”).

Because of its rapid development, several interpretations of the term “urban agriculture” exist, capturing nuances within different local contexts. Among those, two definitions stand out: one, from the influential publication *Urban Agriculture: Food, Jobs and Sustainable Cities* authored and edited in 1996 for the United Nations Development Program (UNDP) by Jac Smit with Annu Ratta and Joe Nasr; and the other, by Luc Mougeot in 2001, which provides an extension of the former, stressing that it is “its integration into the urban economic and ecological system” (Mougeot 2001, 9) that distinguishes urban from rural agriculture rather than its urban location only:

Urban agriculture is an industry that produces, processes and markets food and fuel, largely in response to the daily demand of consumers within a town, city or metropolis, on land and water dispersed throughout the urban and peri-urban area, applying intensive production methods, using and reusing natural resources and urban wastes, to yield a diversity of crops and livestock. (Smit et al. 1996, 1)

Urban agriculture is an industry located within (intra-urban) or on the fringe (peri-urban) of a town, a city or a metropolis, which grows and raises, processes and distributes a diversity of food and non-food products, (re-) using largely human and material resources, products and services found in and around that urban area, and in turn supplying human and material resources, products and services largely to that urban area. (Mougeot 2001, 10)

Smit's and Mougeot's definitions are nowadays the most commonly used ones, and we value them for their simplicity, openness, and implicit inclusion of a cradle-to-cradle approach. It is a sign for the emergence of a new systemic thinking in many disciplines and around the world that the cradle-to-cradle concept, which argues for closed-loop systems according to the principle that "nature doesn't know waste," was published around the same time (Braungart and McDonough 2002).

The boundaries of both definitions for "urban agriculture"—as a primarily output-driven and ecological approach to urban food growing—have nonetheless raised their own challenges as more people from diverse backgrounds engage with the practice. New practitioners have magnified the range of actual locations, qualitative and quantitative goals, economic models, activities, and produce types included in urban food-growing projects. This has, in turn, increased the need to design spaces, objects, and processes that enable the integration of urban agriculture into the urban fabric. The question of physical and social location opens another subject area where design tasks lie: in place making and in the creation of stakeholder networks concerned with food issues.

WICKED PROBLEMS REQUIRE WICKED SOLUTIONS

It is neither possible nor desirable to feed a city solely through urban agriculture. However, coordinated and well-managed relationships between urban, rural, and international agriculture can lead to an environmentally optimal and equitable urban food system. The process of shifting to a more equitable and sustainable food system has rightly been characterized as a "super wicked problem" (Gorgolewski, Komisar, and Nasr 2016). The wicked problems related to food, such as one-way resource flows, income discrepancies between producers and consumers and embedded public health consequences, will require wicked solutions, including appropriate urban design, if change is to be managed, beneficial and evolutionary.

In pessimistic future scenarios of extreme resource shortages and a possible return to a society that looks something like "neo-liberal feudalism," the prospects for urban agriculture may be fairly straightforward. In these scenarios of real scarcity with extremes of wealth and poverty, urban agriculture is likely to become established out of necessity, as a survival strategy for most, while alongside it, another "luxury" version may co-exist, serving a privileged niche community.

To an extent and with regionally differing characteristics, this division can already be found in the more affluent cities of the Global North and South. It is "wickedly" intertwined with our society's omnipotent economic system whose uppermost aim to maximize commercial viability for an individual or a neighborhood still rules out the large-scale success of alternative food systems.

Contrary and in parallel to the above, a deeper investigation of many urban agriculture projects trying to operate commercially has, in our experience, revealed motivations that are not primarily driven by the aim to maximize profits. Rather the desire is to provide for

better, more ecologically sound and health-enabling urban food systems supplying tastier and more varied foods (TUB AM 2011). The reality of most small-scale producers is that, in order to survive, they rely on niche markets for basic income, and this fact comments more on how poorly we value food production than evidences a desire to “cash in.” In any respect, urban—as much as other non-highly industrialized—farming requires too much hard work to make it an easy option for income generation. Most economically viable urban agriculture projects experiment at the same time with wider questions of urban space production, food sovereignty, biodiversity, and ecological literacy clearly confronting the current urban food system.

Additionally, urban agriculture may also have other durable benefits. Recent research by Mikey Tomkins has shown how for many people in London community food gardening is about (re)claiming the public realm and public space and about realizing that urban space is made, and not (a) given (Tomkins 2013). Although community food gardening is not intended to feed cities, it may raise awareness and generate a desire for more resilient urban food systems run by professional urban farmers.

The key question in a time with fundamental environmental and social problems, as known to all of us and described widely, seems now to be *how* to transition to a food system that is reliable, equitable, and attractive to both producers and consumers. If resilient cities that include food-productive landscapes are the wicked solution in strategic terms, *how* do we move toward them practically? Rationally, it is possible to see how urban agriculture can close resource loops and provide jobs in cities and also contribute positively to urban life qualities. However, while some recent “evolutionary” solutions, such as mobile phones, have spread like wildfire, clearly meeting a new demand, urban agriculture, as part of a solution to the pending food crisis, has not. Its practice and discourse are developing at speed, but do not yet impact in a way that is comparable to, for example, the “virtual world.”

While questions of yield and technique drive the applied and technical development of urban agriculture, we argue that an equal emphasis must continue to be placed on uncovering the desires that will drive people to support urban agriculture. The short history of urban agriculture as a conscious movement shows that this “uncovering” has been pursued by mainly two strands of protagonists: by the new urban farmers or gardeners themselves and by international researchers of multidisciplinary backgrounds looking at urban agriculture as a contribution to an optimistic future, rather than only as a response to either food poverty or “dilettante indulgence.” Not seldom, researchers, farmers and activists were (and are) the same people.

SECOND NATURE AND URBAN AGRICULTURE: A CULTURAL FRAMEWORK

Apart from environmental campaigners and urban farmers, for the last one hundred years, several architects, landscape architects and urbanists have been and are at the forefront of initiatives and concepts advocating urban agriculture (Bohn 2014). Johann von Thünen first defined “sustainability” and devised, around 1830 in Germany, a concept for locating food production around cities so as to minimize the energy needed for bringing the produce to the consumer (Thünen 1826). English town planner Ebenezer Howard's vision of small garden cities embedded in agricultural land able to support them with food dates back to the 1900s (Howard 1902). In the 1920s,

German landscape architect Leberecht Migge, drawing on garden city ideas developed in Germany, significantly advanced concepts for integrating urban food growing spaces into housing areas (Haney 2010). Additionally, dating back to the 1930s, US architect Frank Lloyd Wright allowed private and communal plots for food growing in his design concepts for Broadacre City (Wright 1932). However, none of these and other plans for urban food growing did really take off.

We suggest that the designers' visions could not maintain or secure a place in cities because none of them fully addressed popular perceptions and popular culture. If people in houses with gardens wanted to grow food, as Migge and Wright encouraged, they could. If people living in smallish cities with immediate access to rural production wanted to trade food directly, as von Thünen and Howard suggested, they could. But without the necessity, everyone is not a farmer. This, on the other hand, does not mean that people would not value being surrounded by a working productive urban landscape. In fact, the continuing urban sprawl evidences the popular wish of many citizens to live close to the countryside.

Assuming that nowadays a desire for urban agriculture exists, the challenge is, as it was 80 or 100 years ago, to enthruse citizens sufficiently to create long-term urban spaces for long-term food production. However, the mass self-growing of food in the current cultural and economic climate, even if professionalized and commercially viable, is unlikely to become the primary source of urban food, so, not everyone does need to be a farmer. In the food-productive city of the future, people will be able to choose the level of their involvement.

So, to put it simply, the food-productive city, town, or metropolitan region—i.e., an entity including urban agriculture similar to those imagined by our selected designers and many others—requires not only two, but three things: it needs not only to boast urban landscapes that produce food (and digest food waste) and purpose-built, food-focused interventions enabling the produce to reach the table, but also an urban population that likes the food produced and wants to buy it, eat it, and work with it.

This has been known to involved planners, practitioners and researchers for the last 20 or 30 years, and cities are now frequently talking about the need to readjust their current urban food systems. Recent developments in practical implementation have taken the urban agriculture subject beyond the case study stage into policy consideration with thousands of projects worldwide to show the actual growing, experiment with it, and consume its fresh produce. Still, there is neither widespread implementation, acceptance nor desire. We are aware of the necessary elements, but could it be that an overarching theory or philosophy is missing that reached a wider range of citizens better than the existing theories, often driven by environmental or technical concerns?

With this in mind, we started a few years ago to investigate the usefulness of the *Second Nature* concept to further the case for urban agriculture and food-productive landscapes (Viljoen and Bohn 2014). From the numerous meanings of the term *Second Nature*, we have chosen three major ones that seem especially relevant to discussions on the future of urban food production. First, *Second Nature* can describe “behavior,” embedded, normalized habits and customs—everyday activities—that take place regularly and without a thought (Hegel 1830). In this interpretation, *Second Nature* is seen as (part of) human nature. Secondly, *Second Nature* can also refer to “human-made,” especially to human-made space, i.e., non-nature. Usually, this space is thought of as urban and surrounding us in a similar way to “*first nature*,” the natural. *Second Nature* becomes “anti-nature” with the urban being defined as “assemblies and encounters” (Lefebvre

1976). Third, in some theories, *Second Nature* proposes a “new wilderness,” the re-introduction into the urban of new landscapes that focus on ecologies and infrastructure (Geuze and Skjonsberg 2010). *Second Nature* is seen here as designed nature related to and relating ecologies, ecological systems and infrastructure.

Each of the three interpretations of *Second Nature*, from its specific angle, seems to be able to explain, reflect and compliment strategies or desires behind the current and projected practices of urban agriculture and their qualitative effects on urban food production as well as on urban space production. This allows us to think and interlink subjects along these lines; the future of urban landscape can be linked to the future of urban food production. Food production happens on cultivated land. Cultivated land is man-made, constructed, be it urban or rural. The constructed has been linked to the second meaning of the concept of *Second Nature*, described above. (Re-) introducing food-productive landscapes into urban sites may allow for new infrastructures and ecologies that can be considered that urban site's *Second Nature*, the third meaning described. The production of food—sowing, tending, harvesting, but also processing, preparing—constitutes for many people a very embedded, regular activity, a custom. And even more, that food's consumption as exemplified in people's diverse but distinct food cultures and eating habits can be seen as the person's *Second Nature*, in the first meaning described above.

THE GROWING PRACTICE OF URBAN AGRICULTURE

Irrespective of definitions, desires, and perceptions, over the last ten to twenty years, design research and academic explorations of urban agriculture and its spatial effects have significantly increased in the Global North. From an architectural and urban design point of view, concepts such as *Agrarian Urbanism* (Waldheim 2010) and *Transition Towns* (Hopkins 2008), as well as our *CPUL City* (Viljoen and Bohn 2004), are examples of thinking holistically about the origin, current practice and/or future of spatially integrated urban food production.

The contemporary new forms of urban agriculture in the Global North have, in the main, originated in North America and spread to the UK and Europe since the early 2000s. The establishment of economically viable schemes for various types of urban agriculture during the past five to ten years is new on both sides of the Atlantic, complimenting older, more leisure-based and communal practices, such as European allotments or North American community gardens. While urban agriculture fundamentally aims for higher yields and more intrinsic connection into the urban food system than these existing practices, allotments, with their 100 years of experience in (subsistence) urban food growing for individuals, and community gardens, with their 40 years of experimenting with collective management and business models, are invaluable references for urban agriculture theory and practice.

In Germany since about 2005, urban food growers have steadily gained ground, especially but not only in more socially oriented urban agriculture activities. The number of community gardens in Berlin has doubled during that time and is now about 120 (Rosol 2006; STADTacker.net *n.d.*). Leipzig, Munich and Cologne have also become important food-growing hubs, and, since 2010, the “edible town” Andernach frequently creates headlines in the news (Andernach *n.d.*). Since 2012, the facilitation of “productive

landscapes” has been laid down as a development aim in Berlin's open space planning strategy (SenStadt 2012). In 2015, the International Building Exhibition [IBA] in Heidelberg started to support Germany's to date most ambitious (live) urban agriculture project: the *Landwirtschaftspark*, a citizen-network-based process, aims to stabilize and develop existing commercial farming as well as new farming models within the city boundaries into an integral element of the city's food, spatial and educational systems (IBA 2016).

In the UK, the *Capital Growth* project gave the London community gardening scene an important boost in 2009 with the goal of creating 2,012 new projects in the three years leading to the 2012 Olympics. Several British cities, such as Brighton (Brighton & Hove Food Partnership 2012), Bristol (Bristol Food Network 2010), Leeds (Leeds Permaculture Network *n.d.*) and London (Sustain *n.d.*), have developed strong dedicated food-growing networks and programs since at least 1999, which is when Sustain, the country's most important food and farming organization, was founded. The first farmers' market was set up in Bath in 1997 (BFM 2009), followed by the nationwide establishment of the National Association of Farmers' Markets in 1998 (Pavitt 2005), and policy interest is evident in several places, for example in London with the *Cultivating the Capital* report (London Assembly 2010) or in Brighton & Hove where the local council requires a statement about food growing for every new-built planning application (Devereux 2012).

In the Global North, the United States have long pursued urban agriculture practice and research in close cooperation with Canada, where urban agriculture research and dissemination began in the late 1970s, mainly through the Canadian *Cityfarmer* newsletter (c. 1978) and later website (c. 1994) (City Farmer *n.d.*; Levenston *n.d.*). Since the 1970s, the US community gardening scene has steadily and significantly grown in its exploration of alternative space production on a spatially, socially and politically larger scale. At least two important publications originate from here: Smit et al's UNDP publication (1996), referred to above, and the American Planning Association's *Policy Guide on Food Planning* (2007), referred to below. Since about five years, it is the commercially viable urban agriculture projects in US-American cities that have set the pace internationally.

Using exemplary projects already underway in Milwaukee, London and Berlin as a reference, allows us to illustrate a variety and richness of economic approaches typical of any movement in the transition between a pioneering phase and the establishment of norms of practice. Currently, the economic models for funding exemplary new urban agriculture projects in these cities are converging toward either social enterprise or straight commercial models, with food markets often providing crucial support for both. A number of common strands for setting up urban agriculture projects become evident when analyzing the business models of these social enterprises.

All of them started with *access to land*. In the case of the organization *Growing Power* in the United States, this was an existing 0.8 hectare [2 acre] market garden with greenhouses in Milwaukee (*Growing Power n.d.*). For *Growing Communities* in the UK, it was a modest space within an existing London park and two small sites nearby which were not ideal, and needed much work to make them productive (*Growing Communities n.d.*). *Agrarbörse Ost* in Germany gained access to land because it acted as public agency for several charitable projects, which involved the construction or maintenance of public sites.

Compared to conventional enterprises, each organization spent *a prolonged time developing* and refining its practice. Over more than ten years, *Growing Power* developed low-impact, intensive growing techniques and established vegetable markets in poor

neighborhoods as well as a second center in Chicago, thereby extending practice beyond its base in Milwaukee. Site tenure and reliable leases with sympathetic landlords were critical for all enterprises to be able to invest in the necessary infrastructure. *Agrarbörse* was (and is) lobbying the Berlin municipality for minimum lease times of 12 to 15 years for urban agricultural uses (TUB FGS&E 2011).

Alongside land use tenure, project initiators have to define and evolve business plans that take account of the realities of the market for fruit and vegetables. At a time when the cost of imported food and the salaries of market gardeners are extremely low, many urban agriculture projects will *rely to some extent on grants and volunteering* in order to build economically viable business models. It is likely that this situation will change in the future as food prices rise. *Growing Communities* are clear about their relationship to the status quo when stating that “this approach of getting on with creating a viable alternative to the current food system is in the spirit of Buckminster Fuller who said: ‘You can never change things by fighting the existing reality. To change something, build a new model that makes the existing model obsolete’” (*Growing Communities n.d. b*).

Unlike in most rural agricultural enterprises, urban agriculture often takes on a *role in environmental education*, as an economic opportunity on the one hand, and reflecting the desires for alternative urban lifestyles on the other. *Agrarbörse* is not only training gardeners, but attains a considerable amount of recognition and funding through their work with young people, especially through their project *Treibhaus* [greenhouse], a youth center for youngsters but not directly related to urban agriculture (*Agrarbörse n.d.*).

Taking all these facts as signs of a public willingness to address urban food systems, the question now is how best to support the development of urban agriculture and productive urban landscapes so that they can become part of integrated urban food systems, consequently gaining spatial significance within the urban fabric. Four main challenges can be identified, and it is important to address all four of them in parallel within a city’s particular local, regional and international urban food systems: Above all, *productive urban landscapes* are needed in order to coherently embed urban agriculture spatially into urban areas and local contexts, both temporarily and permanently. Research- and planning-led urban design and architectural concepts are thereby critical. Second, appropriate *tool kits, or action plans* are still needed despite the great accumulated knowledge about urban agriculture. Clear applicable guidance and best practice dissemination are essential to enable and augment the capacity of urban food growers, their projects and their sites. Furthermore, *food policy* needs to be devised for individual cities, towns, and regions. Recognized regulations or agreements with public decision makers (e.g., planning, trading, land rights) and other food-related entities (e.g., rural, markets, accreditation bodies) are required to support and safeguard urban agriculture practice and sites. And fourth, *urban food systems* need to be able to develop and diversify. To become widespread and maximize its associated social, public health and environmental benefits, urban agriculture must be integrated into the mainstream food production, procurement and recycling systems.

URBAN AGRICULTURE AND URBAN FOOD SYSTEMS

Urban agriculture is always part of something bigger, be it space, system or human behavior. As a space-use type, it may be part of more strategic concepts, such as *CPUL City* (which we explain below) or other design and development concepts adopted by a

municipality. As a food-growing activity of individuals or groups, it is part of a network of processes aiming to sustain urban life, either directly by the produce grown or by the commercial exchanges it generates. However, supportive policy frameworks, especially food policies, generally do not target urban agriculture alone, but wider and often very complex networks of food provision supplying city dwellers, called urban food systems.

In the 1990s, a number of North American researchers, including Kenneth A. Dahlberg, Mustafa Koc, Kameshwari Pothukuchi and Jerome Kaufman, laid the foundations for an understanding of urban food systems that is still used today. Dahlberg's work, for example, aimed at developing food-related policy as a basis to devise specific strategies for food planning in particular urban contexts (Dahlberg et al. 1997) and emphasized the need for understanding food systems as local systems (Dahlberg and Koc 1999).

Around the same time, Pothukuchi and Kaufman (1999) began advocating for food systems to be placed on the urban agenda in order to fully address the quality of life in urban localities. Both researchers later lead-authored the foundational 2007 *Policy Guide on Food Planning* by the American Planning Authority, which crosses the divide between food systems planning and urban spatial design (APA 2007).

Urban food systems can helpfully be broken down into smaller components such as household or neighborhood food systems (Dahlberg 2002), which makes it easier to tackle more local challenges, provided that the bigger picture stays in focus. Urban agriculture and productive urban landscapes are, or should be, part of both scales of urban food systems. While the former thereby focuses on the actual food-growing activities, productive landscapes describe frameworks to enable spatially coherent thinking about urban food.

At this spatial level, the necessary planner-designer-practitioner dialogue has just begun. In Europe, the Sustainable Food Planning Group within the Association of European Schools of Planning (AESOP), set up in the city of Almere in the Netherlands in 2008, is at the moment the most active networking and research platform for such dialogues. Since its foundation in 2008, the group has held annual international conferences featuring work on many aspects of the urban food systems and urban agriculture discourse (AESOP *n.d.*). The publication *Sustainable Food Planning: Evolving Theory and Practice* (Viljoen and Wiskerke 2012) is a milestone from the group, bringing together selected papers from the *2nd AESOP Sustainable Food Group Conference* in Brighton in 2010, demonstrating an overriding aim to get people from diverse disciplinary backgrounds to talk to each other.

This brings us back to the key question of why urban agriculture still has not been taken up more fully despite all the popular activity, supportive research and good will surrounding it. Is it popular culture that restricts (urban) agriculture? Or is urban agriculture just not important enough as a subject? Or the opposite: is it too important and difficult?

DESIGNING FOR URBAN AGRICULTURE

In 2007, just one year prior to the first AESOP conference on sustainable food planning in Almere, the Netherlands Architecture Institute (NAI) in Maastricht held the world's first design-led urban agriculture exhibition, *De Eedbare Stad [The Edible City]* (NAI 2007). This brought together an international group of leading architects, artists and designers to test urban food growing within their work. Even though both events happened in the

Netherlands, their agendas and participants only overlapped at the margins, evidencing the challenge of improving communication between the various practitioners in this subject area.

However, while historic models of urban agriculture evolved out of necessity, in the contemporary city, we now have a window of opportunity to *plan* coherent strategies for their introduction and to *design* their components and processes. In our 2005 *CPUL* book, we argued for a mix of open urban space uses around urban agriculture, as well as a mix of foods from various origins for the urban consumer (Viljoen 2005). There, we presented estimates for potential self-sufficiency in fruit and vegetables of up to about 30 percent. Subsequently, similar figures have been calculated by other planners and researchers (Sorkin 2012; Tomkins 2009).

While produce quantities are the key challenge when designing for urban food production, we contend that urban agriculture in its spatial sense, as fields, growing surfaces, productive spaces, can contribute positively to cities in a number of different ways. Looking at issues of access as an example, food-productive space can range from publicly accessible, “edible landscapes,” such as those being integrated into cities in the Netherlands by the Social Design Lab for Urban Agriculture (Urbaniahoeve *n.d.*), to the formative, often larger and private-enterprise organoponicos found in Cuba (Viljoen and Howe 2005). Both types of production contribute to the public realm: the former ones directly, in such a way that participation and harvesting by all is encouraged, and the latter ones by providing a visually shared landscape, much as rural farming landscapes are enjoyed by visitors to the countryside.

But more than accommodating visual access by means of a distant “gaze,” commercially viable urban agriculture often gifts a new type of urban place to the city, such as the edges of productive fields that can be used for relaxation or outdoor work, or by providing spaces and venues for celebrations, weddings and parties. Projects such as New York’s much publicized Brooklyn Grange Rooftop Farm (Brooklyn Grange 2012) do this explicitly, thereby not only engaging in new types of urban place making, but also in new forms of enterprise, generating income to supplement that from crops.

Since the wave of literature on urban agriculture from around the turn of the century, much has been discussed and written about the various benefits of (re)accommodating food growing into urban design. As urban agriculture in all its different forms appears and grows within cities, the next critical step is to write planning documents and legislation. In doing so, as cities like New York, Berlin or London have, a rich public discourse is developing, articulating urban agriculture’s many benefits, from environmental motivation to ornament to behavior change, and challenging the normative view of what constitutes appropriate urban space use. Equally, the interest in productive urban landscapes has spread, and several urban planning reports now explicitly recommend their introduction or support in cities such as Detroit with the *Detroit Future City* report (Deadline Detroit 2013), Berlin with the aforementioned *Strategie Stadtlandschaft* (SenStadt 2012) and Leeds through the *TRUG/Urban* project (Urban *n.d.*). Implicitly, we find productive urban landscapes being applied more widely, such as in the ten European cities, including Bristol, Athens, Göteborg and Lyon, that participated between 2012 and 2015 in the EU-funded research project *URBACT Sustainable Food in Urban Communities* (Jégou and Carey 2015).

In addition to drafting planning documents and legislation, the other critical step, where architects, planners and designers have a lot to do, is to knowingly bring forth the design and implementation of processes, landscapes, buildings and infrastructure that

new urban farmers and the wider urban population will require. Our own work aims to contribute to these challenges by proposing design strategies and prototypes that can make urban space more food-productive as well as more desirable for its users. We start from our experience of dense European/Western urban areas and attempt to enrich the qualities of urban life while, at the same time, reducing the negative environmental impact of current urban food systems. We have developed the *CPUL City* concept to address this.

CPUL City describes an urban future based on the planned and designed introduction of what we call “Continuous Productive Urban Landscape”—landscapes defined by urban agriculture—into existing and emerging cities (Viljoen 2005). *CPUL City* has fundamental physical and social implications. It follows a systematic approach and proposes that urban agriculture can contribute to more sustainable and resilient food systems while also adding beneficially to the spatial quality of the urban realm. It is an environmental design strategy and provides a strategic framework for the theoretical and practical exploration of ways to implement such landscapes within contemporary urban design (Bohn and Viljoen 2010a).

The *CPUL City* concept recognizes that each city and each site will present a unique set of conditions and competing pressures informing the final shape and extent of its productive landscapes. It envisages a “mixed economy” of growers practicing urban agriculture: projects for the community and by the community, small-scale and large-scale, commercial and communal, low technology and (appropriate) high technology. Broadly speaking, commercial-scale production will be necessary if urban agriculture is to have a quantifiable impact on food production, while personalized production is very significant from a social- and behavior-change perspective. As said before, urban agriculture will not meet all of a city's food needs, and any in-depth review of urban food systems must consider relationships between a city, its citizens, its local region and beyond.

What we have described as a “wicked solution” to this complex set of relationships will need to act on several fronts, engaging policy makers, food and farming practitioners, spatial designers and the public. With this in mind, the *CPUL City* design concept comprises a toolkit of *CPUL City Actions* to provide a comprehensive and multi-scale strategic framework of actions for the practical and planned implementation of productive urban landscapes and urban agriculture (Bohn and Viljoen 2010b). If these actions can be harnessed to produce future infrastructure, then we may soon see urban agriculture take its place within cities as an essential and desired element of urban infrastructure, ultimately providing more experience with less consumption.

CONCLUSION: FROM THE PRESENT TO THE FUTURE OF URBAN AGRICULTURE

Urban agriculture, in comparison to other popular trends, such as the above-mentioned adoption of mobile phones, is different, being both new (e.g., in terms of process and ambition), but also familiar with respect to memories of farming and landscape. It reintroduces to cities a positive desire for the rural that, even if it did not ever exist in their realities, probably occupies a place in residents' imagined past. Developments during the past few years have demonstrated that culturally and economically vibrant cities also have a great popular desire and ability to support ambitious urban agriculture proposals. The array of existing and emerging urban agriculture projects already found across the world shows that there is no shortage of such desires as evidenced by the spectrum of

fascination, experimentation and innovation testing solutions for a contemporary mode of urban food production. Two of the most direct and perhaps ideologically neutral areas for exploring desires in this context are *food culture* and *public open space*.

The media attention given to food culture is one of those areas where shifts in public perception can clearly be witnessed, and, although it can be argued that this still veers more toward “privileged niche markets” than raising consciousness about sustainable urban food systems, there is nonetheless sufficient focus on the origins and qualities of food to enable the urban agriculture movement to creatively and critically capitalize on this growing public awareness.

Especially within the design and planning professions, a much discussed consequence of urban agriculture is its impact on public open space, as well as on popular desires for and perceptions of green space around and on buildings in general. The potential contribution of urban agriculture to public and open space as part of a new productive urban landscape is one of the aspects of urban agriculture that has been explored since the late 1990s. However, the spaces envisaged when designing a food-productive city, such as a *CPUL City*, do not only contain urban agriculture, but strive in their everyday use to be health-enabling, equitable, economically stable, and convivial. In the long term, their success will depend on the ability of the urban food system to adapt to popular culture. At the same time, many contemporary food-focused spaces show how they shape popular culture.

The concept of *Second Nature* might further the development of a societal framework allowing us to understand attitudes to the urban food system more holistically. People’s everyday (food-related) behavior, new food-productive spaces within the built fabric, and a new type of multi-functional urban landscape can then emerge as equally important components of a resilient urban future. In this future, food spaces (to be) created are green and open, and they flow out and into the countryside, and back from there, as do wildlife, air, and, above all, people.

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