

Edited by
**André Viljoen and
Katrin Bohn**

SECOND NATURE URBAN AGRICULTURE

DESIGNING PRODUCTIVE CITIES

Ten years on from the Continuous Productive Urban Landscape (CPUL City) concept



Second Nature Urban Agriculture

This book is the long-awaited sequel to *Continuous Productive Urban Landscapes (CPULs): Designing urban agriculture for sustainable cities*.

Second Nature Urban Agriculture updates and extends the authors' concept for introducing productive urban landscapes, including urban agriculture, into cities as essential elements of sustainable urban infrastructure. Since 2004, when the concept was first put into the public realm, it has had a profound effect on thinking about urban design and the nature of the contemporary city. Driven by the imperatives of climate change mitigation, changing economics, demographics, lifestyle expectations and resource supply, the ideas embodied within the CPUL concept have entered the international urban design discourse.

This new book reviews recent research and projects on the subject and presents a toolkit of actions aimed at making urban agriculture happen. Referencing an international body of work, it addresses issues associated with particular urban

locations and their contexts while drawing out transferable lessons and knowledge. As pioneering thinkers in this area, the authors bring a unique overview to contemporary developments in the field and have the experience to judge opportunities and challenges facing those who wish to create more equitable, resilient and beautiful cities.

The book has three parts: the first develops and contextualises the *CPUL City* theory, the second formulates *CPUL City Actions*, and the third presents a repository of contemporary design and subject references underpinning the CPUL concept and case for urban agriculture. Expert chapters by international authorities support particular themes and thoughts throughout the book.

Prompted by demand from cities, practitioners, activists, designers and planners, *Second Nature Urban Agriculture* is aimed at all those with an interest in developing quality urban spaces for the sustainable city of tomorrow.

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Foreword

William McDonough, co-author of the highly influential book *Cradle to Cradle: Remaking the way we make things* and of the recent book *The Upcycle: Beyond sustainability – designing for abundance*.

...we sow cereals and plant trees; we irrigate our lands to fertilize them. We fortify river-banks, and straighten or divert the courses of rivers. In short, by the work of our hands we strive to create a sort of second nature within the world of nature.

(Cicero, *De Natura Deorum (The Nature of the Gods)*, ca. 45 BC)

Just across the East River from Manhattan, in industrial Queens, there's a one-acre farm atop an old shipping warehouse that produces some of the most prized fruits and vegetables in New York City. On a mid-summer day, while the N train rumbles by a few blocks away and the Chrysler Building glitters in the sun, an astonishing variety of crops grow in dozens of orderly rows six stories above bustling Northern Boulevard. There are Red Mizuna Greens, Black Krim Tomatoes, Bull's Blood Beets, Masai Bush Haricot Verts, Shisito Peppers, Thai Basil, and Purple Haze Carrots as well as numerous varieties of watermelon, cucumber, cantaloupe, and kale. Honeybees hum around stacked hives and egg-laying hens peck and preen and shuffle in their nests. Farm workers sell the morning's harvest to a crowd of shoppers and pack boxes of tomatoes and greens for nearby restaurants. In every sense, this urban rooftop is a working farm: a cultivated, productive, socially vital landscape embedded in the natural world. Second nature.

Anomalous as it may seem today, urban agriculture was our second nature for thousands of years. Tilling soil and sowing seeds were the *ur*-gestures of civilization, acts that inscribed human hopes on the land, entwined nature and culture, and transformed unsettled terrain into human places where *we* belonged. Mesopotamian and Egyptian cities were intensely agricultural, as were the Greek city states and Cicero's Rome. In each, tilling and irrigation constructed beneficent second natures within densely populated settlements, while agricultural knowledge and custom – the domestication of seeds; mathematics, engineering, and ethics; the preparation and sharing of food – nourished dynamic urban

cultures. Cities and agriculture co-evolved spectacularly. Empire drove them apart, but when I was growing up in Tokyo, farm and city were still engaged, nearby neighbors; farmers led poop carts through the streets every night, picking up nutrients for the soil. The true anomaly is the perceived dualism between nature and culture, food production and city life.

Keenly aware of the history and generative potential of urban agriculture, André Viljoen and Katrin Bohn are devoted to making it commonplace. With *Second Nature Urban Agriculture*, they offer a thorough exploration of the field from an architectural and urban planning perspective, drawing on research, fieldwork and case studies to present a framework for integrating agriculture into cities. Like Cicero, they see second nature as a productive landscape embedded in the natural processes of "first nature" and recognize the interdependence of first and second natures as the foundation of robust, resilient food systems.

Fine essays on the theory and practice of Continuous Productive Urban Landscapes make the important case for agriculture as an essential element of urban infrastructure and economies, while an informative collection of project-oriented stories from Berlin, London, New York and Detroit evokes the energy and creativity animating today's leading food-growing cities. Together, Katrin, André, and their contributors have achieved the lofty goal of producing a full-bodied repository of ideas, principles and actions that support long-term, well-financed, ecologically intelligent, superbly designed spatial responses to the challenge and opportunity of feeding people that live in cities. They have taken a giant step toward renewing the civilizing legacy of urban agriculture.

That is very good news. The long separation of city life and natural systems was good for neither. 'Nature, in the common sense', Emerson said, 'refers to essences unchanged by man; space, the air, the river, the leaf.' But surely we have changed them. We inherited a food

system and a way of building cities that devalued the essences of each – soil, water, plants, people – making second nature an erasure of natural assets rather than a generative, supportive landscape for the well-being of living things. While industrial farming decimated the world's topsoil, planners misread the nature of urban form. Ebenezer Howard's *Garden Cities*, Corbusier's *Ville Radieuse* and Frank Lloyd Wright's *Broadacre City* all sought to reconcile urban and rural, but betrayed the stark divide between the city and the soil.

In the last 20 years, however, the parallel movements of organic agriculture and ecological design have been thoroughly reimagining second nature, dramatically improving the generative capacity of buildings, landscapes, urban farms and city food systems.

A few design questions have been influential: How do we become native to our place? In other words, how does nature work right *here* and what does the land tell us about what thrives in *this* soil? If we recognize the laws of nature as a model for good design, and the health of the soil as a measure of productivity and wealth, how do we develop positive, supportive interactions between natural systems and human communities? And, from an urban design perspective: What if buildings, like trees, were soil-makers and photosynthetic actors, living organisms participating productively in their surroundings?

Those questions set the course for the upcycling of second nature. A building like a tree is designed to fit in an ecosystem, not overpower nature or limit human impact. Enmeshed in local energy flows, it harvests solar income, makes food from sunlight, filters water and creates a supportive habitat for people and other living things. Offices, factories and schools with solar collectors, greenhouses and water filtration systems accrue energy and provide organic food, clean water and good jobs. They leave a beneficial ecological and social footprint.

Green roofs, like the rooftop farms profiled in these pages, take high-performance second nature to the landscape level. Not all green roofs grow food for people, but the ways in which they preserve soil nutrients, support plants and generate urban photosynthesis provide a bridge to large-scale urban farming. The living roof atop Ford Motor Company's River Rouge plant in Dearborn, Michigan – a ten-acre urban garden – is only the most

visible element of a living, landscape-scale stormwater filtration system, which includes porous paving and underground basins, as well as constructed wetlands, swales and wooded meadows. A scientifically cultivated network, it dramatically reduces the rate of flow of stormwater into the Rouge River while also absorbing carbon dioxide, making oxygen, purifying the soil and providing habitat for birds, butterflies and insects.

With insights from the evolution of green roofs and from the work of brilliant farmers developing permaculture, hydroponics and rooftop soils, architecture and agriculture are no longer estranged. In Neemrana, India, when we designed a 62,500 square metre "Garden Factory" for Hero Moto, the nation's largest manufacturer of motorcycles, our leading design question was: What if a factory could be a garden of health and productivity?

It can. With a solar array, vegetated air-purification wall, rooftop greenhouses, daylighting, and ductless air delivery, the factory will generate or harvest nearly all of its needs: oxygen and fresh air for people, carbon dioxide for plants, irrigation water and hot water, electricity, cooling, food and both factory and food production jobs. Farm follows function. The building is not simply "a machine in the garden" nor "a garden in the machine." It's alive; the machine *is* a garden.

Can urban agriculture again become an embedded habit and cultural norm? Along with André Viljoen and Katrin Bohn, I believe it will. Reading their study, one begins to appreciate the energy and intelligence driving today's urban farming enterprises. In New York City, for example, urban food production is booming and the agricultural network is rooted and strong. There are commercial farms and farms focused on community engagement; farms that practice intensive, open air, soil-based cultivation and those devoted to greenhouse hydroponics. There are rooftop, building-integrated and land-based farms, as well as 700 food-producing gardens and 50 schools that incorporate student-grown food in school lunches. The network includes commercial apiaries, composters, seed banks, farmers' markets, restaurants, soil doctors and farm design services, as well as, of course, those Mizuna Greens, Black Krim Tomatoes and Masai Bush Haricot Verts.

Food has a future – we have a future – when cities build second nature from the soil up.

Preface

We started thinking about this book in 2008 in Brighton when discussing with John Thakara the legacy of the DOTTO7 *Urban Farming Project* in Middlesbrough and the need for a guiding set of *actions* for implementing productive landscapes; to which John simply and dryly said, ‘you need to write another book.’

Second Nature Urban Agriculture continues our exploration of how urban agriculture can be coherently integrated into cities. However, working on the book did not quite become our “second nature”, and too many worthwhile events, often related in one way or the other to the urban agriculture theme, distracted us, but also broadened and enriched our perspective.

For some time we called the book to be written “CPUL 2”, marking it as a direct sequel to our 2005 book which formulated the Continuous Productive Urban Landscapes (CPUL) concept. While *Second Nature Urban Agriculture* remains a companion volume, it also became clear to us that now, more than 10 years after the CPUL City concept’s inception, this new book will be less singularly about CPUL and much more about the production of urban space in a wider, productive sense.

The concept of *second nature* began to interest us. It seemed to complement strategies and desires behind the current practices of urban agriculture in towns and cities of the world.

The term “second nature” has a double meaning: on the one hand it describes embedded, normalised habits and customs that take place without a thought, and on the other it refers to the manmade, *cultivated* space surrounding us in a similar way to (first) nature. Can urban agriculture be part of a second nature to both people and cities in the 21st century? Or has it started to be so already? Why should it, and how? Can or should planners, architects and designers play a role in making urban agriculture a true second nature, given

that their profession is engaged with the production of space and hence also influences people’s habits and behaviour?

It was only in the early 19th century that the term “second nature” was thoroughly developed in both senses to mean normalised habits and to define the manmade, the cultured, as a development of the natural, thereby suggesting that culture represents a somewhat higher, but different entity. Norbert Rath describes how the contraposition of “nature” and “culture”, as it was still sustained in philosophy at the beginning of the 20th century, could no longer be upheld towards the century’s end. However, human action will always be part of second nature, because it is subject to cultural conditions, as much as it produces them (Rath 1996).

Henri Lefebvre’s interpretation of “second nature” is helpful when envisioning a sustainable urban future and questioning methods for its design. For Lefebvre, urban environments are socially productive environments, and become second nature. According to Erik Swynge-douw and Nikolas Heynen, it is this notion that ‘paves the way to understanding the complex mix of political, economic and social processes that shape, reshape and reshape again urban landscapes’ (Swynge-douw and Heynen 2003). Regarding the social production of urban environments, Lefebvre suggests:

Nature, destroyed as such, has already had to be reconstructed at another level, the level of “second nature” i.e. the town and the urban. The town, anti-nature or non-nature and yet second nature, heralds the future world, the world of the generalised urban. Nature, as the sum of particularities which are external to each other and dispersed in space, dies. It gives way to produced space, to the urban. The urban, defined as assemblies and encounters, is therefore the simultaneity (or centrality) of all that exists socially.

(Lefebvre 1976: 15)

Thinking about these interpretations in relation to urban agriculture, there seems to be a great opportunity here for the ‘town heralding the future world’ – that second nature – and its inhabitants to make a sustaining production their own, their second nature. At the same time, such new ownership reintroduces experiences of first nature into the urban, producing a new type of urban space that has the potential to lead to a greater unity with nature.

It is this interdependence of first and second nature that most significantly influences our thinking about productive urban landscapes. The term “productive” establishes a link between the urban and the landscape, both of which are still often considered opposites in the people’s perception of the city. The link has already started to be made by those urban inhabitants that produce food. It has become their second nature.

So much has been written about urban agriculture, and much has been grown, built and experimented with during the last ten years marking the time between the press date of *CPUL 1* and this book. Our 2005 *CPUL* book had to make the case for urban agriculture in the first place; the new book aims to make the case for planned and desired action in order to more permanently establish urban agriculture in cities. Both times we apply an architectural and urban design perspective. And whilst our 2005 *CPUL* book collated diverse arguments which until then had not been related into a spatial understanding of urban food systems, the new book is already able to present not only written arguments, but also experience that has emerged from actual realised projects.

With the number of built projects expanding, and a long-standing international group of research friends and colleagues creating substantial repositories of case studies and practice, we drew our boundaries tightly: the focus is on *project initiation* and *design strategies* for productive urban landscapes. To that end, we opted for direct experience, so the book, in the main, refers to projects that we visited or were involved with from Germany, the UK and the USA. This is not to suggest that the ideas voiced are only relevant to these places. As if to confirm this, while finishing off this book, it has been agreed to translate *CPUL 1* into Chinese.

As with the 2005 *CPUL* book, we follow the practice of entering a critical dialogue with invited specialists to contextualise our concept and to develop and deepen themes where we as architects remain generalists. We hope that the resulting varied and critical voices will help readers to understand urban agriculture as second nature in the full meaning of the term.

The book starts by engaging a series of urban design thoughts and theories that may hold keys to the successful implementation of a food-productive city and that contextualise the subject area from a variety of expert viewpoints. At the same time, this part of the book contributes to the refining of the *CPUL City* concept based on practice, research and observations since 2005.

The second part of the book presents the *CPUL City Actions*, our planning and design guide for implementing more localised urban food systems based on urban agriculture. These four actions have been formulated during our work and practice, and with them we aim to propose a framework spanning between community food gardeners, commercial urban farmers, academic researchers, architects, planners and, above all, local residents.

We conclude with a CPUL-relevant Repository of resources that has been compiled by bringing together all the references from preceding chapters, presenting a snapshot from the time of writing. The intention is twofold: one is to visualise the *CPUL City* concept in relation to significant urban agriculture texts and projects, the other is to provide an applied canon of important works that will remain useful to practitioners, professionals, academics, policy makers and the public for quite some time.

In a nutshell: a lot has changed since 2005, but still, when we imagine a “desirable future”, we see more experience with less consumption.

André Viljoen & Katrin Bohn
BOHN&VILJOEN ARCHITECTS

CPUIL
CITY
THEORY

An introduction

Katrin Bohn and André Viljoen

Food is a sustaining and enduring necessity. Yet among the basic essentials for life – air, water, shelter, and food – only food has been absent over the years as a focus of serious professional planning interest. This is a puzzling omission because, as a discipline, planning marks its distinctiveness by being comprehensive in scope and attentive to the temporal dimensions and spatial interconnections among important facets of community life.

(APA 2007)

In 2007, a US-American team of urban planners led by Jerry Kaufman formulated this now familiar pivotal thought as part of their substantial work on relationships between the food system of an urban entity, its spatial design and development planning. Published and adopted by the American Planning Association (APA), the resulting *Policy Guide on Community and Regional Food Planning* is widely accepted as marking the beginning of a new era which had been carefully and tirelessly prepared for by its protagonists over many years: food has finally entered the public and professional consciousness to the extent that the systematic designing and planning of food-related urban spaces can begin.

This does not mean that issues around urban food production, distribution, retailing, consumption and waste recycling had not been discussed before. Neither does it mean that the design professions were unaware of the influence food-related issues can have on product, space, event or process design or had not worked with these issues. Both subjects – let's bundle them under the headings 'urban food system' and 'designing for Urban Agriculture' – had been investigated for between 20 and 30 years by a variety of players worldwide. But, the APA report took this early activist-like work to a new level: it urged its legislative recognition, thereby paving the way for legally grounded, longer term, better financed, environmentally conscious and designed spatial responses at urban, rural and regional levels addressing *one* overriding issue: feeding people that live in cities. Which is half of the world's population (WHO 2012).

One might ask what the significance of these points – and hence this entire book – is for the other half of the world's population; those that live in rural areas. Additionally, the frame of reference of this book and of this subject area as contextualised by the APA report concentrates on the Global North, whilst the main urban population growth is happening in the developing countries of the Global South (WHO 2012). Who and what are we aiming for with this work?

Durable change will occur through small steps, but steps that thoroughly engage the imagination of all (or most) people for a fair, healthy and desirable future. Such durable change is needed everywhere, and the imagination of a fair future is no further developed in the Global North than it is in the Global South, and no more in cities than in villages. The challenge is to start. Addressing the problems which one is a part of is one way of starting. It may indeed only produce a small step, a small change, but – for us – these are the problems that surround us, concern us and hence require our attention.

Nowadays there is tangible evidence emerging of insights that urban food-growing protagonists intuitively always spoke about, for example: urban agriculture will augment the appreciation of rural agriculture (we speak of urban–rural linkages); it will encourage people to reward the effort that goes into producing good fresh or exotic food (think farmers' markets or fair trade); it will change the way we live in our cities (we speak of space production, participation and lifestyle choices). With our type of work, we may not immediately solve the problems of rural populations in the Global North or South, but we can create practical and conceptual conditions that – in small steps – contribute to changing the unsustainable way cities in the Global North feed themselves today. Achieving this, would really change a *great* deal...

In this first part of the book, we would like to highlight some of the theoretical discourses which provide the current academic context for work on productive urban landscapes and urban agriculture and therefore also of our work on the *CPUL City* concept. It may be worth noting that most of these 'theoretical discourses' are actually very practical, reflecting the fact that the generation of knowledge in this subject area often happens via the experiment, the empirical and its subsequent observation and evaluation.

Urban Agriculture on the map

It is undeniable that urban agriculture practice and discourse have increased dramatically over the last ten or so years. On a practical level, the frequent first scepticism has usually converted into passive acceptance with the next step being to turn this into active support, which, in many cases, has already started. At the same time, on an academic level, the relationship between urban agriculture and local urban food systems has become much clearer, and their interdependencies with peri-urban and regional supply and demand have been articulated in much greater detail. The question now is how, in the future, urban agriculture should sit *on the map*, literally spatially, but equally in terms of environmental, social and economic durability.

In the chapter *Growth and challenges since 2005*, we are taking stock, trying to summarise how and why urban agriculture has moved from a marginal subject to the centre of attention in a comparatively short time and on a global scale. The chapter loosely concentrates on the book's three case study countries – Germany, the United Kingdom and the USA – and it starts its observations around 2005, the publication year of our book *CPULs Continuous Productive Urban Landscapes*. The following chapter *The CPUL City concept* then looks specifically at the Continuous Productive Urban Landscape work as an example for how the subject area has been embedded into the international urban design discourse.

Whilst, at the end, the CPUL work focuses on the urban and architectural design implications of urban agriculture, Kevin Morgan, who researches innovations in governance and development, places a goal post by highlighting in his chapter *The new urban foodscape: Planning, politics and power* the necessity for supportive food policy and its incorporation specifically into municipal planning in order to facilitate any substantial urban food-growing activities. He describes examples of first moves in this direction and concludes that a successful alliance between the local state and its civil society could 'begin to foster rather than frustrate ecological integrity, public health and social justice'.

Joe Nasr, June Komisar and Mark Gorgolewski reinforce in their chapter *Urban Agriculture as ordinary urban practice: Trends and lessons* the need for broader strategic

action when arguing that there is nowadays so much evidence of interest in and practice of urban agriculture that it has become a ‘commonly recognized activity within the urban context’. The architect authors suggest a spatial typology based on a variety of case studies underpinning their contention that urban agriculture has started to transform ‘from a theoretical concept with occasional, exceptional, experimental manifestations to a common phenomenon’.

Utilitarian Dreams

The year 2005 marked for us the beginning of a further working direction after about seven years of data collection and of architectural and urban design studies as contributed to the urban design discourse around this time. We began to broaden our design research into the qualitative aspects of urban agriculture space by discussing its visual and social perception with various artists, curators and filmmakers. British artist Tom Phillips devised the name ‘Utilitarian Dreams’ for a collaborative exhibition between Cuban and British architects and artists held in Brighton at the end of 2005 (UoB 2006). The interplay between the poetics of a working landscape and the hands-on necessities for its success are still – and always have been – the drivers for our work.

The chapter *Food growing in urban landscapes* therefore describes the spatial qualities that we, as architects, envisage for productive urban landscapes and that we see many others envisaging too, as these spaces are starting to emerge in cities around us. In the following chapter, *Productive life in the city*, we discuss emerging economic and socio-cultural characteristics of CPUL-City-like space during the early stages of its integration into European and North American cities. The chapter also addresses the rising desire of those involved with urban development and governance to find ways of measuring urban agriculture’s social and environmental benefits so as to aid and underpin policy development supporting sustainable and healthy food plans.

Yrjö Haila’s chapter *The city in the fabric of eco-social interdependence* reinforces yet another way of thinking about the utilitarian and the dream. Haila, a philosopher and environmental policy researcher, sees

contemporary cities as part of a historic environmental continuum and understands them as ‘ecological formations in a metabolic or physiological sense’ and believes that as such ‘they create novel types of ecological communities’ with human action being ‘an integral element in the dynamics of such communities’. Much in the ‘Utilitarian Dreams’ sense, he concludes that ‘not every urbanite needs to become a gardener, but every urbanite needs food’.

In her chapter, *Sueños Utilitarios: La Habana*, Yuneikys Villalonga questions how ‘the landscape and the city update, in response to the new realities and necessities of society’. Villalonga, curator of the second part of the ‘Utilitarian Dreams’ project, a multidisciplinary exhibition in the Cuban capital in 2006, describes the different interpretations of productive urban landscapes by the participating artists and architects. These highlight the closeness of the utilitarian to the dream-like, of the poetic to the prosaic, of the landscapes in our imagination to those that can be created in our cities in the future. But, as Villalonga says, ‘beyond the cities referred to, “Utilitarian Dreams” reflects upon a global urban awareness, which concerns every place and everyone’.

Environmental impact and Urban Agriculture

In our 2005 CPUL book, we discussed the environmental impact of industrialised food production in an overarching way and, from a sustainability, suggested urban agriculture as part of an alternative solution. Now with the increased practical and academic experience of about ten years, we can re-discuss urban agriculture in a similarly overarching way. The advantage of the fast and sometimes overwhelming increase in urban agriculture activity in the Global North now allows us to take stock for the first time, both of its quantifiable and qualitative aspects. Is it possible to practically assess urban agriculture’s environmental impact on the city, or the other way round; the city’s impact on urban agriculture?

The two chapters *Diversity* and *Water, soil and air* aim to take account of this duality: whilst the former attempts to scope out the mostly positive environmental impact

urban agriculture can have on urban diversity in a wide sense, the latter addresses the challenges urban agriculture faces when its practices could have negative results. The chapter *Diversity* argues that urban agriculture responds to more than concerns about food miles and relates it to issues such as biodiversity, local diversity or diverse food cultures and open space uses. *Water, soil and air* presents a review of concerns about the impact of pollution on urban agriculture, especially on soil, followed by a section on alternatives to soil as a growing medium.

In her chapter *Economies of scale: Urban Agriculture and densification*, Gilleen Denny argues that different scales of food production need to be taken into account when discussing the potential environmental impact of urban agriculture. Through a life-cycle analysis of specific fruit and vegetables, Denny, an architect, can show how, 'through increasing local opportunity for production and procurement, emissions for specific produce can be reduced across the entire life of the produce'. She concludes that 'in the end, fresh produce emissions reveal that it is not only what we eat, but also how it is procured that will make the greatest difference in this interconnected food world'.

Mikey Tomkins, an urban beekeeper and urban agriculture researcher, discusses in his chapter *Bricks and nectar: Urban beekeeping with specific reference to London* the environmental importance of the honeybee for all human life and the ability of urban agriculture to help retain bees in cities. According to Tomkins, 'urban beekeeping is largely a cultural practice' – hence of second nature – and his chapter lays out its 'interconnecting components' relating them to spatial concerns. Bees, so Tomkins argues, 'already think about landscape as continuous, extending our concept of the CPUL as essential infrastructure beyond superstructure and into the atmosphere that ultimately connects us all'.

Green theory in practice and urban design

As mentioned earlier, urban agriculture is a primarily practical movement. Theoretical ideas about 'green' lifestyles, sustainable urban or architectural design, and participatory uses of urban space or local food

production are immediately mirrored in actual projects and prototypes. Protagonists of these types of contemporary urban space production draw from socio-cultural, ecological or design history and theory and, at the same time, theorists learn from the practical experience of commercial or communal food-growing projects.

The first two chapters developing this direction of thought look more closely at Germany and the United Kingdom to explain their current state of urban agriculture and the food-related interdependencies found within particular case studies. Great Britain and Germany are certainly not the only European countries that have seen a dramatic increase in urban agriculture activities during the last ten or twenty years. The Netherlands must be mentioned as a place where urban food-growing research and practice has helped to shape the subject in Europe and worldwide. Other countries with a 'green' approach to urban living are also often found among those where people engage in urban agriculture, often in connection with educational programmes. There are also a number of regions in countries all over Europe where urban food growing supports daily food needs.

Nishat Awan, in her chapter *Agential exchanges: Thinking the empirical in relation to productivity*, investigates philosophical and historical examples in order to ask 'what type of activity urban agriculture is, or could become'. She argues that, as urban agriculture is 'on the verge of becoming mainstream', the extreme pressure on land is an important factor necessitating redefinitions of the notions of productivity, value and agency. Awan, an architect and urban practitioner, uses built projects, many from the UK, to illustrate some of the interrelations which, when addressed, would allow 'for a more nuanced understanding of what could be considered a "success": how much production is productive enough?'

In his chapter *Shrinking cities and productive landscapes*, architect and writer Philipp Oswalt relates the contemporary urban land use debate to economic, ownership and urban development theories. Oswalt suggests that 'urban agriculture can play an important role in creating spatial and social cohesion within the European city', but that there are different degrees of urgency when implementing urban agriculture depending on the specific spatial and economic situation of the city in

question. Referencing situations in Germany and the USA, he concludes that 'it will always be important to reserve space for uses such as urban agriculture in order to improve the quality of urban life'.

Laboratories for Urban Agriculture: the USA

The range of new projects in the USA is staggering, and if Cuba's urban agriculture, as studied by us about ten years ago (Viljoen 2005), revealed spatial possibilities and the effectiveness of systematic support systems, the current US initiatives are now testing different spatial, technical, organisational and financial models of production. We have started a new design research project under the above title – some of whose outcomes are presented throughout this book – which we understand as a continuation of our earlier project *Laboratories for Urban Agriculture: Cuba* that featured in the 2005 CPUL book.

Baltimore, Milwaukee, Detroit, New York and Chicago are amongst a vanguard of North American cities actively encouraging urban agriculture. In this section of the book, we are looking at the US-American situation with a focus on *New York* and *Detroit*. Detroit's well-publicised situation is resulting in numerous small-scale urban agriculture initiatives and some very ambitious urban agriculture proposals for commercial and social enterprises. Urban space is truly transformed. In New York it is the range of building-integrated urban agriculture projects, now complementing the city's vibrant community garden scene, that is of particular interest to us, because of its internationally pioneering role and, again, its relation to the CPUL City concept.

Whilst our observations of the situations in Detroit and New York often are of a personal nature, Nevin Cohen looks at 'case profiles' from the same cities in an attempt to draw conclusions about the planning and policy frameworks that can support 'emerging forms of urban agriculture'. In his chapter *Policies to support Urban Agriculture: Lessons from New York and Detroit*, Cohen, an urban and environmental planner, contends that such frameworks 'should evolve from a focus on zoning to support the existing networks of gardens and farms in cities to a more comprehensive assessment of emerging forms, scales, and configurations of urban agriculture'.

STOP PRESS: Because of the considerable changes that recently happened in Detroit, this chapter was updated in Spring 2013.

Elisabeth Meyer-Renschhausen in her chapter *Community gardening in Berlin and New York: A new eco-social movement* zooms in again to the scale of one such form of urban agriculture: the community gardens. Looking at the political, social and environmental history and context of community gardening in two exemplary cities in Germany and the USA, Meyer-Renschhausen investigates why and how 'this kind of new urban agriculture ... has become a symbol and a form of positive protest'. Meyer-Renschhausen, a freelance researcher, author and political campaigner, concludes that 'community gardens are no longer utopia', but that they 'belong to the future of cities'.

We are aware that this excursion into thoughts and theory only broadly outlines the complexity of issues at stake when planning and designing productive urban landscapes. It hopefully also emphasises the pleasures, challenges and big positive benefits of engaging in the building of urban agriculture, be it practically in the city or theoretically in people's minds – or both, which would take us the furthest. Because it is so practice-based and because its practitioners are so active and inventive, this field of research and design research moves fast. The insights and knowledge assembled here were collected up to the end of 2012, with a few earlier or later exceptions. They will change and develop over time. However, their message will remain: The future of a city lies in the way its people are being fed. And the future of a desirable city lies in the way its urban space provides for food.

Urban Agriculture on the map: Growth and challenges since 2005

Katrin Bohn and André Viljoen

Undeniably, during the last twenty or so years, urban agriculture has become an increasingly common feature of many urban areas in the Global North and – responding to social, environmental and economic concerns – has long been practised in the Global South. It is now widely understood as a movement and as an urban space-use typology.

Because of its rapid development, several interpretations of the term ‘urban agriculture’ exist, capturing nuances within different contexts. Amongst those, two definitions stand out: one, from the seminal publication *Urban agriculture: Food, jobs and sustainable cities* authored and edited in 1996 for the United Nations Development Programme (UNDP) by Jac Smit with Annu Ratta and Joe Nasr, and the other, by Luc Mougeot who, in 2001, 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)

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.

The boundaries of both definitions for ‘urban agriculture’ as a primarily output-driven and ecological approach to food growing have none the less raised their own challenges as more people from diverse backgrounds engage with the practice. New practitioners have increased the range of locations, qualitative and quantitative goals, economic approaches, activities and produce types included in urban food-growing projects, and this has, for example, resulted in the need for a broad understanding of the word ‘industry’. For an open and public discourse this is a good sign, testifying not only to the concept, but also to a general will and interest in making it useful for different international urban contexts.

Urban and peri-urban agriculture (UPA) is currently the most commonly used alternative term, even though the ‘peri-urban’ is already contained in the original UNDP definition. This term denotes the food growing activity more precisely by location, highlighting that it is often the areas at the edges of cities that are utilised because of the availability of larger sites and their proximity to existing agricultural infrastructure. It is easier to use this term today than it was 10 or 20 years ago, when it was of paramount importance to make the case that food production should be brought back to the centre of urban consciousness and fabric, rather than pushed to its edge.

Many urban areas in Europe and North America – where our case study countries are located – and elsewhere, are actually conglomerations of one or more smaller cities, suburban and land-locked open, often formerly agricultural, areas. In these metropolitan regions, the distinction between urban and peri-urban may no

longer be useful. Moreover, any urban food system for a city region doesn't exist in isolation, but interacts with its rural surroundings to a degree that the better these interactions are, the better the available food will be. Some researchers therefore speak not of 'urban', but of 'metropolitan agriculture' (REOS 2011).

It is neither possible nor desirable to feed a city solely through urban agriculture, but coordinated and well-managed interrelationships between urban, rural and international agriculture can lead to an environmentally optimal and equitable urban food system. In the 2005 *CPUL* book, we argued for a mix: a mix of open urban space uses around urban agriculture, as well as a mix of foods from various origins for the urban consumer. There, we presented estimates for potential self-sufficiency in fruit and vegetables of about 30%. Subsequently, similar figures have been calculated by other planners and researchers, e.g. Michael Sorkin (Sorkin 2012, see chapter *New York City*, p. 122), Mikey Tomkins (Tomkins 2009) or architect Joe Lobko who presented such findings for a housing development at the 2011 Ontario Association of Architects conference in Toronto (personal communication May 2011). It appears that the terms 'urban farming' and 'urban food growing' most directly take account of this interest in absolute yield. Here, the action of cultivation has priority over spatial or territorial consideration, and the terms are frequently found in community and allotment gardening literature, as well as in education programmes.

In Germany, the term 'urban gardening' has become very popular since 2011, when a book of the same name was published combining articles by a range of authors focusing on the 'return of productive gardens into cities' (Müller 2011). According to Frauke Hehl, a Berlin-based community garden activist, the term circulated informally in Berlin prior to 2011 (personal communication Jun 2012). It was first used in English, and only now enters the German discourse in its German translation as 'urbanes Gärtnern', a detail that offers yet another angle on the subject of local appropriation. Either way, a conscious distinction from the food growing focus of urban agriculture can be observed in Germany, where the wide spectrum of community gardening's social benefits are brought to the foreground influencing the public discourse on and perception of what urban agriculture is.

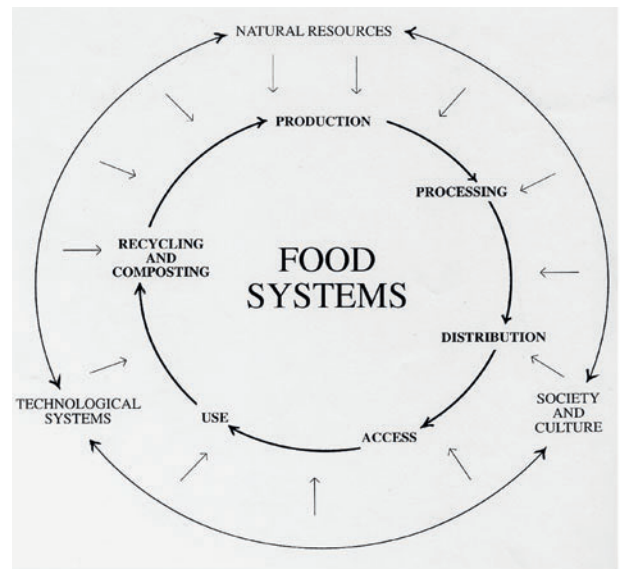


Fig 1: What are local food systems? This early graphic representation by Dahlberg of the principles of how food impacts on the city is one of a series of diagrams each showing a food system at a different scale: household, neighbourhood, municipal and regional food system (Dahlberg 2002). (image: Kenneth A. Dahlberg, 1993)

Another group of researchers and practitioners refers to their activities under the heading 'urban horticulture'. Numerous universities and research centres, especially in the USA and Germany, run courses and research in this subject, and the International Society for Horticultural Science (ISHS *n.d.*) offers an international knowledge exchange network. Technically speaking, this term might be more correct for the growing of what are mainly vegetables, herbs and fruit within the urban realm. However, it has established itself to encompass work focusing on horticultural practice and sciences rather than the integration of agriculture into urban spaces.

It is probably simply the stark contrast between the words 'urban' and 'agriculture' – picture them both individually – that triggered the imagination and creativity of those who used the term and sent it out into the world with a question mark – and with an exclamation mark attached. Above all, it expresses the duality of a spatial observation – the adjacency and immediacy of the urban and the field ('agri') – and a direct action – to grow ('culture').

The growing practice of Urban Agriculture

Irrespective of definitions, over the last ten 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 *et al.* 2004), are examples of thinking holistically about the origin, current practise and/or future of spatially integrated urban food production.

The contemporary and new forms of urban agriculture in the North have, in the main, originated in North America and, looking eastwards, spread from there around the early 2000s to the UK and Europe. The establishment of economically viable schemes for various types of urban agriculture during the past five, or even ten to fifteen years, is new on both sides of the Atlantic, complimenting older, more leisure based and communal practices, such as the European allotments or the North American community gardens.

Urban agriculture brings many advantages to a city – social, health, environmental, local, educational – and can be (and sometimes is) practised not with the primary goal of food production, but of achieving outcomes in these wider fields. However, international experience from the previous years shows that more and more projects are being set up explicitly to produce food in larger quantities and/or that existing practice is being optimised. The increasing emergence of projects that are demonstrably successful enterprises – traditionally economic or social – provides proof of (and a reality check for) the acceptance of productive urban landscapes as a desired and planned urban land use.

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 90 (Rosol 2006; TUB 2011), 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 the UK, the *Capital Growth* project gave the London community gardening scene an important boost in 2009 with the goal of creating 2,212 new projects in the three years to the 2012 Olympics. Several British cities, such as Brighton (Brighton and Hove Food Partnership [BHFP] 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 programmes since at least 1999 (which is when Sustain 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 and Hove where the local council requires a statement about food growing for every new-built planning application (Devereux 2012).

Amongst our case study countries, the USA has pursued urban agriculture practice and research for the longest. In close cooperation with activities in Canada, urban agriculture research and dissemination began here in the late 1970s – mainly through the Canadian *Cityfarmer* newsletter (started in 1978) and later website (started in 1994) (City Farmer *n.d.*; Levenston *n.d.*). Since the 1970s, the USA community gardening scene has steadily and significantly grown in its exploration of alternative space production at a spatially, socially and politically larger scale and at least two seminal publications originate from here: Smit *et al.*’s UNDP publication, referred to above (1996), and the American Planning Association’s Policy Guide on Food Planning, referred to below (2007). It is now the commercially viable urban agriculture projects that set the pace for the future.

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 in urban centres. The 2005 *CPUL* book gives an account of these from what was known around the years 2003 and 2004 (Viljoen 2005). Equally, the interest in productive urban landscapes has spread, and several urban planning reports

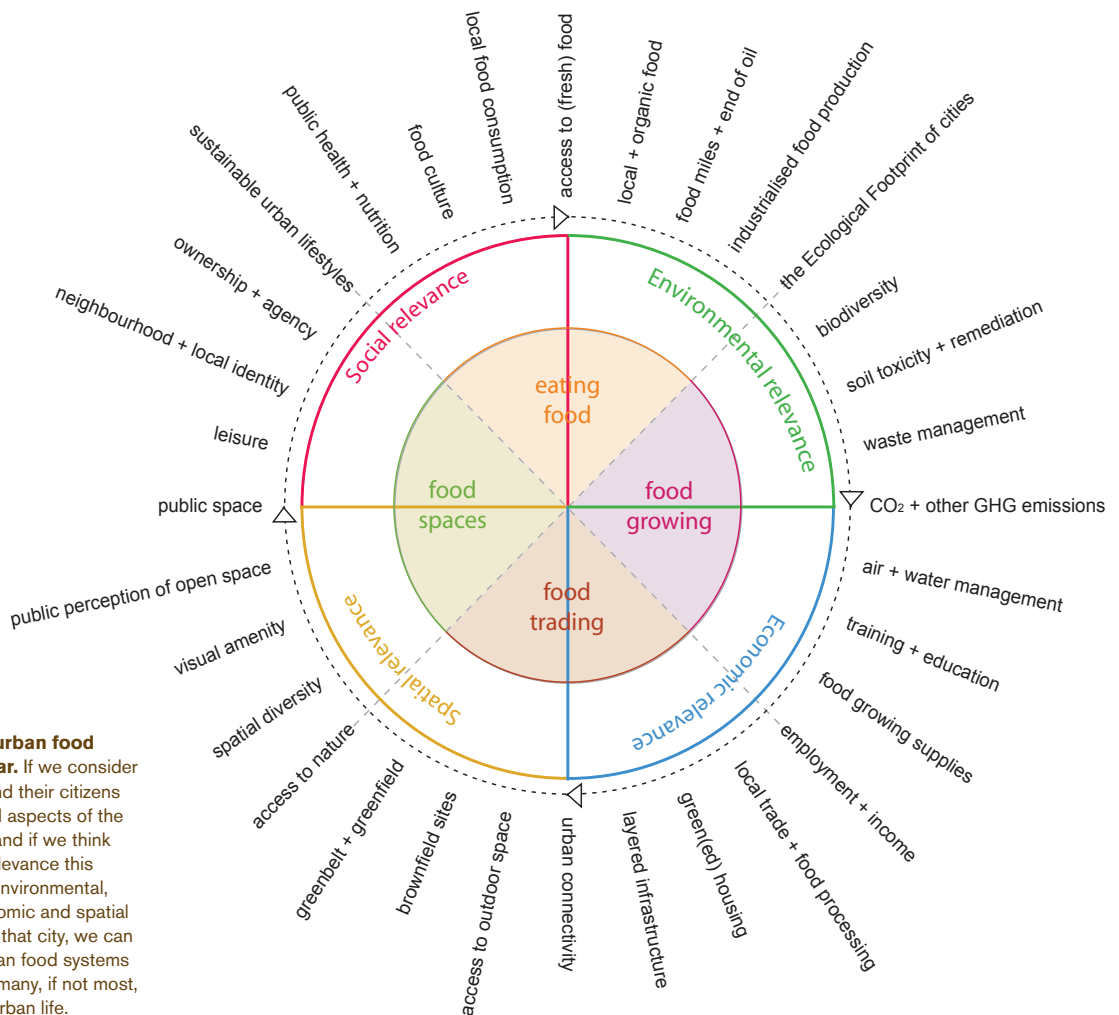


Fig 2: The urban food systems star. If we consider that cities and their citizens engage in all aspects of the food cycle, and if we think about the relevance this has for the environmental, social, economic and spatial character of that city, we can see that urban food systems touch upon many, if not most, aspects of urban life.

now recommend their introduction or support in cities such as Detroit, with the *Detroit Future City* report (Detroit Works *n.d.*), Berlin, with the above mentioned *Strategie Stadtlandschaft* (SenStadt 2012), and Leeds, through the *TRUG/Urbal* project (LMU *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 reach both their full food-growing potential and move beyond niche activism to become part of integrated urban food systems, consequently gaining spatial significance within the urban fabric.

Four main challenges can be identified:

1. 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 needed. *Keyword: productive urban landscape.*
2. Despite the great accumulated knowledge about and the huge social capital invested in 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. *Keyword: toolkit / actions.*

3. Recognised regulations or agreements with public decision makers (i.e. planning, trading, land rights) and other food-related entities (i.e. rural, markets, accreditation bodies) are needed to support and safeguard urban agriculture practice and sites. *Keyword: food policy.*
4. To become widespread and maximise its associated social, public health and environmental benefits, urban agriculture needs to be integrated into the mainstream food production and procurement systems. *Keyword: urban food systems.*

These four challenges need to be developed in parallel within a city's particular local, regional and international urban food system(s).

Urban Agriculture and urban food systems

Urban agriculture is always part of something. As a space use type, it may be part of more strategic concepts, such as *CPUL City* or *Agrarian Urbanism* or other 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. Additionally, supportive policy frameworks – food policies – generally do not target productive urban landscapes or urban agriculture alone, but wider and often very complex networks of food provision supplying city dwellers, called urban food systems.

In the 1990s, mainly researchers in the USA, for example those around Kenneth A. Dahlberg, Mustafa Koc, Kameshwari Pothukuchi and Jerome Kaufman, laid the foundations for an understanding of urban food systems that is still used and referred to 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) emphasising the need for understanding food systems as local systems (Dahlberg and Koc 1999). Around the same time, Pothukuchi and Kaufman began urging for food systems to be placed on the urban agenda in order to fully address the quality of life in urban localities (Pothukuchi and Kaufman 1999). Both researchers

later key-authored the now seminal 2007 *APA Policy Guide on Food Planning* which crosses the divide between food systems planning and urban spatial design (APA 2007). We see urban agriculture and productive urban landscapes as ways to contribute to this vision of a more sustainable and equitable provision of food for cities.

The concept of food sovereignty has been important in raising another significant issue: it is not just access to food that is important, but also the control a community exercises over what that food is. Initially defined during the late 1990s under that banner of *La Via Campesina* [Peasants Way] (Via Campesina *n.d.*), the concept is now widely discussed in urbanised environments and within urban agriculture movements. It fits well with strategies to creatively combine top-down and bottom-up initiatives. Food safety, the complex web of health and equity, also plays into the political concerns regarding the feeding of our cities and the type(s) of urban food system(s) needed.

Food systems can helpfully be broken down into smaller components – such as household or neighbourhood 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.

To achieve this multi-scale integration requires a specific dialogue between planners and designers, and, before this can happen, a shared language needs to be developed, built on the knowledge that has already been generated around urban food systems. For example, comparing Dahlberg's 1993 food systems diagram (Fig 1) with one that we created in 2009 from an architectural and urban design perspective (Fig 2) shows one of the gaps that need bridging between urban food system planning and designing for urban agriculture, namely the consideration of 'space'.

At a spatial level, the necessary planner–designer–practitioner dialogue is just beginning. In Europe, the Sustainable Food Planning Group within the Association of European Schools of Planning (AESOP), set up in Almere (NL) in 2008, provides 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 progressing work on many fronts 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) brings 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'.

Designing for Urban Agriculture and the next steps

For the planning and design professions, competitions, conferences, consultancy, campaigning, live building projects, publications, exhibitions and teaching are all ways of contributing to the dialogue about more resilient and sustainable local, urban and regional food systems. We will be looking at some of these in the chapter *The CPUL City concept* (p. 12) from a CPUL perspective.

In summary, we can say that *designing* for urban agriculture actively and consciously started around the year 2000 with some, but few, earlier individual projects. Whilst urban theoreticians discussed the subject area, especially in the USA, design practitioners began to visualise the qualities and necessities of urban food growing on either side of the Atlantic. Interestingly, in theory and design practice, the architectural and artistic professions have led the way in developing propositions.

Just one year prior to the first AESOP conference on sustainable food planning in Almere in 2008, the Netherlands' Architecture Institute in Maastricht held the first urban agriculture exhibition, an art and architecture exhibition *De Eedbare Stad* [The Edible City] (Solomon 2007). This brought together an international group of leading architects, artists and designers all, at that time, testing urban food growing within their work. Even though both milestones happened in the Netherlands, their agendas and participants only marginally overlapped pointing again to the challenge of improving communication between the various practitioners in this subject area.

In the USA, the multidisciplinary work on *Landscape Urbanism* (Waldheim 2006) and on *Agricultural Urbanism* (Salle and Holland 2010) stands out, because both concepts not only encompass the idea of productive urban landscapes, but also underpin them with grounded theoretical arguments drawn from a variety of backgrounds.

The immediate challenge for the design professions remains twofold: to communicate the qualities and possibilities of food growing architecture and landscape to all audiences, both at a theoretical/planning level and at a hands-on/practical level. However, recent discussions with planners and activists in all three case study countries confirm our observation that practice is outstripping policy, as individuals take forward urban agriculture projects at a range of scales and aims.

So, whilst 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 its introduction.

As urban agriculture, in all its different forms appears and grows within cities, the next critical step is to get it 'written into' planning documents and legislation as one proactive way of improving current urban food systems and providing value beyond direct financial return. In doing so, as cities like New York, Berlin and London have, a rich public discourse develops, articulating urban agriculture's many benefits – from environmental motivation to ornament to behaviour change – and challenging current measures of success. The other action required – and here architects, planners and designers have a lot to do – is to knowingly bring forth the designing and building of processes, landscapes, buildings and infrastructure which the new urban farmers and the wider urban population need and desire.

Finally, the biggest challenge is to transition from the current narrowly focused agri-food business model to one that redefines the urban-agricultural relationship. At the end, it is about understanding that the Earth is our limit and that there are others coming behind us (some of whom we might personally know). In order to work with 'limit earth' and not against it, urban design and urban practice need to include an action's total environmental impact, and urban agriculture has proven to be one way of accounting for this.

Urban Agriculture on the map: The *CPUL CITY* concept

Katrin Bohn and André Viljoen

Our own work aims to contribute to the challenges set out in the previous chapter by proposing design strategies and prototypes that can make urban space more productive for cities and towns and more desirable for their citizens. We start from our experience of the dense European/Western urban area and attempt to enrich the qualities of urban life whilst, at the same time, reducing the negative environmental impact of current urban food systems. We have developed the *CPUL City* concept to address this.

Fig 1: The CPUL concept. Green corridors provide a continuous network of productive open space containing routes for non-vehicular movement. Variable fields for urban agriculture and other outdoor work/leisure activities are located within the network and serve adjacent built-up areas.



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).

Central to the *Continuous Productive Urban Landscape* concept is the creation of open urban space networks providing a coherent and designed multifunctional – productive – landscape that complements and supports the built environment. CPUL's physical manifestation will fundamentally change the urban landscape and implies an equally fundamental change to the way societies and individuals experience, value and interact with that landscape. Within the *CPUL City* concept, urban agriculture refers in the main to fruit and vegetable production, as this provides the highest yields per square metre of urban ground. Key features of CPUL are outdoor spaces for food growing, leisure, movement and commerce shared by people, natural habitats, non-vehicular circulation routes and ecological corridors. Its network connects existing open urban spaces, maintaining and, in some cases, modifying their current uses (Viljoen *et al.* 2004).

Designing a CPUL (or an individual CPUL space later to become part of a CPUL) therefore means the creation of a qualitatively rich urban landscape which, above all, strives to incorporate the growing of local and organic food. The food-productive use is overlaid with and interconnected to other urban uses on the same site

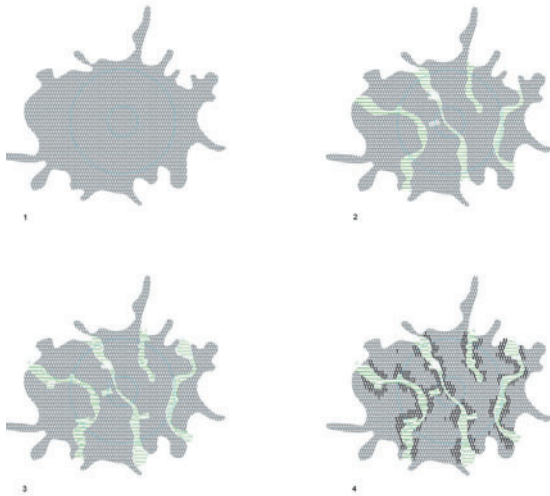


Fig 2: How to make a CPUL City.

1. Bring your own city.
2. Map all your existing open spaces and connect them through green infrastructure.
3. Insert agriculturally productive land. (Note: you may wish to alternate between 2 and 3.)
4. Feed your city!

suggesting physical and visual access to nature everywhere in the city or town as an important step towards emerging urban lifestyles and new ways of producing space and place.

A systemic approach needs to be taken to integrate the physical CPUL/CPUL space into existing or new local urban food systems or their components, such as a stakeholder network or waste recycling or water system. These webs of complex interdependencies spun around urban food systems constitute the *CPUL City*. Of major importance for the success of *CPUL City* is the simultaneous design, planning and establishment of 'mini' interdependencies enabling the recurring sequence of successful food growing: *preparing the soil – planting – growing/caring – harvesting – eating/processing/preserving/selling – composting/seed production*.

The *CPUL City* concept recognises 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 practising 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, whilst personalised production is very significant from a social and behavioural change perspective. As the previous chapter makes clear, 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 local region and beyond.

All of these arguments were formally presented in our 2005 book *Continuous Productive Urban Landscapes: Designing urban agriculture for sustainable cities*. Various environmental, economic and socio-cultural arguments confirm that the benefits of such a landscape are significant enough to consider it an essential element of sustainable urban infrastructure in future cities (Viljoen and Bohn 2005).

The CPUL concept grew out of our design research exploring the role of urban agriculture within urban design during the 1990s and was first designed in 1998 as part of Bohn&Viljoen's competition entry to the European architecture and urban design competition *European 5*. At this time, in the UK, increasing density as solely measured by numbers of people per square kilometre was being used as a crude shorthand for sustainable development. This unthinking acceptance of density has resulted in the loss of significant areas of open urban space and represents a misreading of the UK's *Urban Task Force* report which called for increased density and mixed use as part of a wider sustainable strategy (The Urban Task Force 1999). We argue that an intensively treated open urban landscape can compensate for the potentially lower building density which it requires and call this strategy 'Ecological Intensification' by which the aim is to reduce the entire environmental footprint of each new development. Further architectural and urban design studies, as well as the research of statistical, mostly UK-centred data, resulted in the *CPUL City* concept being underpinned by a number of inter-related social, environmental and economic arguments, as well as design arguments, for what would amount to a radical change in the configuration and programming of open urban space within an overarching desire to find more self-sustaining ways of living (Viljoen and Bohn 2000).

Urban Agriculture within the current urban planning and design discourse: A CPUL perspective

Addressing the complexities of the urban food system, the *CPUL City* concept touches on many current discourses of very different natures. Three of these stand out in that they require the expertise of the urban designer, planner and architect and would benefit from their input: the discourse on urban agriculture, the discourse on urban landscape – in particular productive urban landscape – and the discourse on participatory design.

In relation to the Global North, the urban agriculture discourse was originally an ‘English-speaking’ discourse originating in Canada in the late 1970s (City Farmer *n.d.*). A solid body of literature exists since the early 1990s with publications from Canada, the USA and Great Britain being at the forefront of the debate. This ‘earlier’ literature concentrates on urban agriculture’s positive impact with respect to food security, public health and income generation in places with high levels of social and economic deprivation. Often the research projects feeding into publications were conducted with or for internationally acting NGOs, such as the UN, and often concerned urban food systems in the Global South, as exemplified by the Canadian book *Cities feeding people: An examination of Urban Agriculture in East Africa* (Egziabher *et al.* 1994). The publication in 1996 of the book *Urban agriculture: Food, jobs and sustainable cities* (Smit *et al.* 1996) was a landmark in defining an international role for urban agriculture and may be considered seminal to a sequence of publications, academic and popular. The main author, Jac Smit, who in 2004 wrote the forward for *CPUL 1*, is considered by many as the ‘father of urban agriculture’ referring to both his pioneering work in putting the subject on the table and the dissemination of the term ‘urban agriculture’ itself.

After this book, the engagement with the subject rapidly increased globally, probably fuelled by the sudden and efficient integration of urban agriculture into Cuban cities during the 1990s and the widespread digestion of findings and agreements of the *Earth Summit* in Rio de Janeiro in 1992. Academics and practitioners in the Global South and North now looked at urban food growing from a variety of interdependent angles, beginning

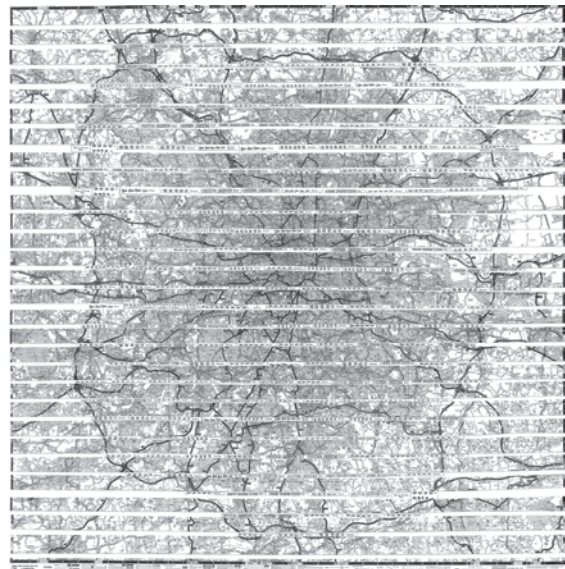


Fig 3: Exploded London. One of our earliest spatial visualisations: Adding an extra 30% to London’s surface area would allow London to cultivate all its fruit and vegetable requirements without changing any existing open space.

to draw strands of research together and to transfer generated knowledge across the hemispheres. In North America and the UK, themes such as food security (Koc *et al.* 1999), sustainability in urban food production (Caridad Cruz and Sánchez Medina 2003) or the evaluation of urban agriculture field research (Mougeot 2005a) were discussed, as well as economic aspects of urban agriculture (Petts 2001a), the preservation of open space (Petts 2001b) or public procurement (Morgan and Morley 2004). German researchers at that time disseminated work on socio-political subjects such as small-scale urban agriculture (Meyer-Renschhausen *et al.* 2002) and the encouragement of local food markets (Bechstein and Kabbert 2004).

During the first years of the new millennium, empirical attempts began in the Global North to formulate coherent urban farming positions with the aim of adapting planning frameworks to the emerging needs of urban agriculture. These culminated around 2005 in our three case study countries, for example, in exemplary projects describing the different planning issues at stake within each local context:

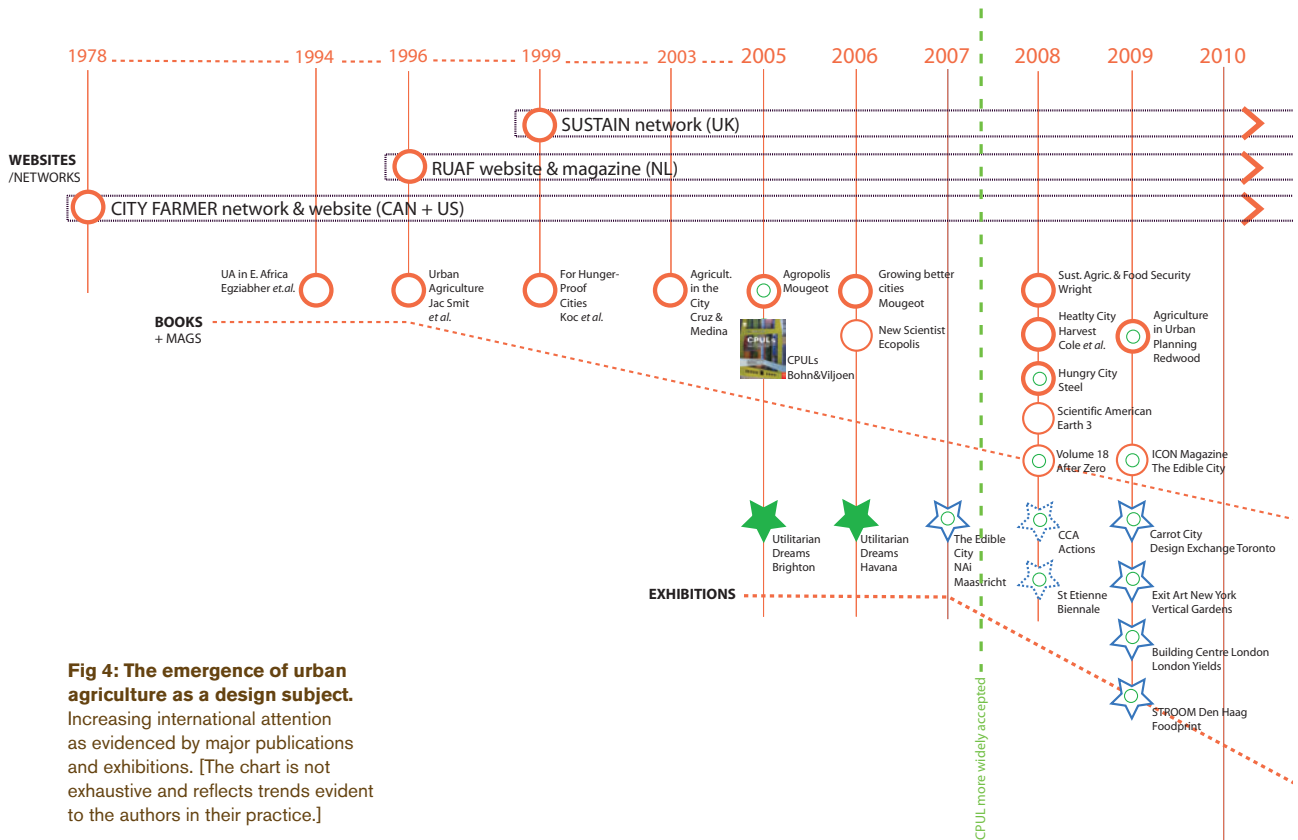


Fig 4: The emergence of urban agriculture as a design subject.
Increasing international attention as evidenced by major publications and exhibitions. [The chart is not exhaustive and reflects trends evident to the authors in their practice.]

- A team of academic and student researchers of the School of Urban Studies and Planning at Portland State University, commissioned by their local city council, completed in 2005 *The Diggable City*, an in-depth spatial inventory of all potential council-owned food growing sites in Portland (Balmer *et al.* 2005).
- The agronomists behind Berlin-based social enterprise Agrarbörse organised a think-tank meeting in 2006, *Neue Felder für die Stadt* [New fields for the city], between urban food growing activists, local farmers and council representatives to discuss potential mutual benefits from integrating urban agriculture into local space use strategies (Berliner GALK 2006).
- In London, the non-governmental organisation Sustain initiated a whole range of food-awareness campaigns and achieved, amongst others, getting food on the political agenda at a Mayoral level. Since 2001, it runs *London Food Link* and was instrumental in establishing the *London Food Board* and the *Food Strategy Unit* at the London Development Agency in 2004 (Sustain *n.d.*).

While planning for urban agriculture had therefore been on the development agenda for about 15 years, the publication of *CPUL* in early 2005 was the first time that a book was devoted to presenting a coherent strategy for designing contemporary cities by ‘putting questions of productive land use into the centre of urban design’ (Hopkins 2006). The need for and relevance of such concepts may be seen in the international interest the *CPUL* City concept has received during the last ten years: Since 2005, the authors have lectured on their work to public and professional audiences in Austria, Belgium, Canada, Cuba, Denmark, France, Germany, India, Italy, Ireland, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, the UK and the US.¹ Invited articles about the concept have been published widely in architectural/urban design magazines in the above named countries and additionally in China, Korea, Russia and Iran¹. The *CPUL* concept has benefited from favourable comments by activists including Rob Hopkins, founder of the *Transition Towns* network (Hopkins 2006), and is cited by academics and practitioners such as Luc Mougeot (Mougeot 2005b: 12), Jac Smit (Smit 2005), Carolyn

Steel (Steel 2008: 314), Sarah Taylor Lovell and Douglas Johnston (Taylor Lovell and Johnston 2009: 44), Hodgson *et al.* (Hodgson *et al.* 2011: 56), the non-profit organisation *Cultivate Kansas City* (CKC 2011) and Goodbun *et al.* (Goodbun *et al.* 2012: 12).

If it is at all possible to chronologically map such a short history, we may say that during the last five years research interest in the subject has been extended noticeably beyond the prevalence of Anglo-American writing on practice and planning to wider-spread studies emerging, for example, in a greater number of European countries. This body of 'younger' literature continues to reflect on the ecological and economic characteristics or types of urban agriculture, but also concentrates on the many interrelations of urban agriculture to other urban phenomena, especially community development, as exemplified by publications about public engagement and community gardens (Rosol 2006), social benefits of communal gardening in general (Müller 2011) or community health in its wider sense (Campbell and Wiesen 2011).

Architectural and design research has equally diversified with *CPUL City* today being complemented by other urban design concepts for integrating urban agriculture into contemporary Western cities. Often these start from an interest different to *CPUL* and result in a different set of proposals, but all explore the design possibilities of growing food within the urban realm. Most notably, these are Carolyn Steel's *Sitopia* (Steel 2008), *Vertical Farms* by Dickson Despommier (Despommier 2010) and C.J. Lim and Ed Liu's *Smartcities* (Lim and Liu 2010).

Within design disciplines, the dissemination of new ideas takes place as much through the medium of exhibitions and events as through the publication of academic papers. In these disciplines, a rapid increase in interest, exploration and dissemination of ideas about the qualities of spaces for productive urban landscapes/urban agriculture has been evident during the last decade. In Europe, the breakthrough in the discussion of design consequences and possibilities arising from urban agriculture was reached in 2007 when the Netherlands Architecture Institute (NAi) in Maastricht curated an exhibition titled *De Eedbare Stad* (Solomon 2007) (see previous chapter). Since then, the number

of similar exhibitions and 'public works' crossing the thin boundaries of urban design, art and architecture and hosted by leading international design institutions has continued to increase. These include the UK Design Council-led *DOTT 07 Urban Farming Project* in Middlesbrough (2006/07) (Design Council 2008), The Canadian Centre for Architecture's exhibition *Actions: What you can do with the city* (2008) (Borasi and Zardini 2008), the *Vertical Farming* exhibition at Exit Art, New York (2009) (Exit Art 2009), *Urban Agriculture: London Yields* at the Building Centre London (2009) (The Building Centre 2009) and the Dutch art organisation STROOM's three-year *Foodprint* programme (2009+) (Stroom 2009). The Canadian *Carrot City* project (2009+), which, one of its authors, Mark Gorgolewski, tells took its name from chapters in *CPUL 1*, embraces urban agriculture as a design and urban planning subject for the architectural professions in the as yet most complex constellation of international travelling exhibitions, online resources and accompanying book (Gorgolewski *et al.* 2011). The travelling exhibition has been shown in many places worldwide with various companion exhibitions developed around it. The *CPUL City* concept was invited into all of these exhibitions and features in the *Carrot City* online resource and book.

Have we got closer to the *CPUL City*?

The closeness of the urban food subject to the low-energy and sustainability discussion, the ability of architects to synthesise seemingly unconnected issues and the fascination with scenarios for urban futures all provide reasons for the notable presence of the architectural profession in the early moments of the 'movement'.

However, in order to establish whether urban agriculture and productive urban landscapes – or indeed the *CPUL City* concept – are beginning to gain a foothold in today's world, we also have to study how they have impacted on the very real spaces, food cultures, lives and livelihoods of their buzzing – or shrinking – cities.

Whilst the *CPUL* concept was seen as interesting though utopian in 2005, the situation has changed dramatically since then, to the extent, for example,

that in 2011 commentators have defined the Dutch City of Almere's future plans for *Agromere* in Almere Oosterwold as a CPUL (Jansma and Visser 2011). In Agromere, the objective was to explore opportunities to reintegrate agriculture into modern city life. Through a combined stakeholder and design process, a virtual city district on 250 hectares was designed to blend living space for 5,000 inhabitants with urban agriculture (Wageningen UR 2011). This concept design highlighted urban agriculture and contributed to the municipality of Almere's own development plan. In January 2010, the Dutch government decided on the execution of this development plan, which is a 'unique system innovation in Dutch urban planning' (Jansma and Visser 2011).

In terms of disseminating new ideas on urban productivity, food systems, agriculture and their spatial qualities to the next generation, *CPUL 1* is used as a textbook in various university courses internationally covering a range of planning and architectural studies including Universities in Europe, North America, Cuba, China and probably others elsewhere. The number of student projects exploring urban agriculture issues has increased during the last five years. That the subject can stand up well amongst other architectural and urban design themes is best shown by recent competition winners, such as the *The Ark: Continuous Productive Urban Landscape Market* by Stavros Zachariades, University of Bath, UK, winning the EU-wide competition EDUCATE in 2012 (Wood 2012), or the explicitly CPUL-inspired *Adventure Farm* by Robert Hankey, Southbank University, submitted in 2008 to the RIBA Bronze Medal competition (RIBA President's Medals 2008). Within our own academic environments in Brighton and Berlin, students are now able to engage in urban agriculture projects – live projects, design projects and design research² – offering a new student experience that is paralleled in a growing number of institutions forming a new community of practice, including: The Academy of Architecture Amsterdam, University of Brighton, University of Cardiff in Wales, Ryerson University Toronto, TU Berlin, Sheffield University in the UK, McGill University Montreal, the New School New York and Wageningen University in the Netherlands. However, their number has still to grow, a desire and request which has been most clearly formulated by students and young researchers in 2012

during the 4th AESOP Sustainable Food Planning Conference held in Berlin and directed towards AESOP, the Association of the European Schools of Planning (AESOP *n.d.*).

In 2009 and 2010, Bohn&Viljoen Architects was one of about 160 'urban food experts' consulted by the London Assembly's Planning and Housing Committee as part of their investigation into the role of the planning system in supporting commercial food growing in the British capital. The result of this investigation process, published in 2010, is typical of international trends: 'Our report *Cultivating the Capital* calls for changes to the planning system to ... encourage food growing in London' (London Assembly 2010). Now, that is promising!

Notes

- 1 For details, please see <www.bohnandviljoen.co.uk>.
- 2 For details, please see <<http://arts.brighton.ac.uk/study/architecture/architecture-m-arch/student-work/march-studio-1-fields-and-floors-fabricating-interdependent-architectures>> and <http://www.planen-bauen-umwelt.tu-berlin.de/institut_fuer_landschaftsarchitektur_und_umweltplanung/stadt_ernaehrung/menue/city_nutrition_home>.

The new urban foodscape: Planning, politics and power

Kevin Morgan

One of the most remarkable criticisms ever levelled at the planning community actually came from within the profession itself. The criticism was triggered by the fact that planners had addressed all the essentials of human life – land, shelter, air and water – with the conspicuous exception of food. That was the damning indictment that the American Planning Association (APA) cast on planners when it launched its seminal guide on community and regional food planning in 2007, a belated attempt to compensate for its neglect of the food system (APA 2007). The APA's epiphany was brought about by the work of two innovative US planning academics who had concluded that the food system was '*a stranger to the planning field*' (Pothukuchi and Kaufman 2000).

The planning community – academics and professionals alike – needs to engage more consciously with the food system because, with burgeoning urbanisation, cities are looming larger and larger in the food system and the food system is becoming ever more important to the health and well-being of the urban population. Feeding the city in a sustainable fashion – that is to say in a manner that is economically efficient, socially just and ecologically sound – is one of the quintessential challenges of the 21st century, particularly in Asia and Africa, where chronic hunger and malnutrition are most acute. With a majority of the world's population now deemed to be urbanised, the *urban foodscape* will assume ever more significance in food security debates (Morgan 2009; FAO 2011). To explore these issues in more depth, this chapter addresses the following questions:

1. Why has the *food system* assumed such political significance in recent years?
2. How and why are city governments embracing *food policy*?
3. What *local powers* do cities have at their disposal to reform their foodscapes?
4. How can cities become more effective *political actors* in a food system that is increasingly in thrall to corporate power?

From the margins to the mainstream: the political significance of food

It is not too much to say that, until recently, the food system barely registered on the mainstream political agenda in the Global North because of the widely held belief that it had delivered all that was asked of it. Slowly but surely, however, the hidden costs of the conventional food system began to resonate in the public domain. While there is no single reason why the food system has moved from the margins to the mainstream, the escalating costs of diet-related diseases and environmental degradation loom large in any explanation (Morgan *et al.* 2006; Lang *et al.* 2009).

If anything, it is the *multifunctional* character of food that makes it such a unique political phenomenon, because the food system is heavily implicated in so many public policy arenas. In other words, the political significance of the food system stems from the combined effect of the following trends:

- Food security is now perceived as a *national security* issue following the urban riots that erupted in many countries after the food price hikes of 2007/08.
- The food chain accounts for some 31% of *greenhouse gas emissions* in the European Union, making the food system a crucial target of policies to counter climate change.
- The epidemic of obesity and other *diet-related diseases* makes the food system a prime target of campaigners who want to transform the National Health System from a treatment service to a health-promoting and prevention service.
- *Food poverty* is increasingly visible in the cities of the Global North, as we can see from the explosive growth of food banks, making food a social justice issue as well as a human health issue.
- The food system is now perceived as a prism through which planners seek to promote more

sustainable *natural resource management* and ecosystem services.

- A *quality food revolution* is underway as people rediscover the pleasures of good food and its associations with place and provenance (Morgan and Sonnino 2010).

Taken together, these factors have fashioned a *new food equation* with the result that food is no longer a marginal issue in mainstream political discourse (Morgan and Sonnino 2010). From the global to the local level, the food system has acquired a visibility and a salience that it has not known in generations. Globally, this was most apparent when the G8 group of countries convened its first-ever meeting on food security in 2008, a priority that has been reinforced by the more important G20 group of countries. Locally, food policy is now being addressed at the *sub-national* level as local and regional governments are no longer prepared to take their cues from remote national governments, many of whom confuse food policy with agricultural policy.¹

Cultivating connections: how and why cities are embracing food policy

The multifunctional character of food creates challenges as well as opportunities in policy circles. While it helps to raise the profile of food across multiple policy agendas, multifunctionality also compounds the problem of where to locate a policy that straddles so many different domains. Over the past decade, municipalities in many countries have struggled with the question of how to incorporate food policy into their strategies and structures. In political terms this question generates two intensely practical issues – who should assume the leadership role for food policy and in which department should this role be located?

The experience of municipal food politics in Europe, North America and Africa suggests that the answer to this question very much depends on the way food policy is framed; that is to say, it depends on the prism through which the urban food question is viewed and valued by politicians and their civil society interlocutors. Take the Toronto Food Policy Council (TFPC) for example. Created in 1991 as a sub-committee of the city's

Board of Health, and widely regarded as one of the most effective food policy councils in North America, the TFPC has framed its mandate in such a capacious way that it has been able to make a significant contribution to a broad array of municipal policies, including urban agriculture, community gardening, environmental planning, official land use planning, nutritional education and anti-hunger initiatives, where it has sought to highlight the connections between food policy and other policy domains (Roberts 2001; Blay-Palmer 2009; Toronto Public Health 2010).

Municipal food policy in Vancouver offers another instructive example. Local food policy officially began in 2003, when the city council approved a motion supporting the development of a 'just and sustainable food system', the twin frames of a subsequent *Food Action Plan*. A notable feature of the food governance debate in Vancouver concerned the balance of power between city government and the community-based Vancouver Food Policy Council (VFPC). The *Food Action Plan* had originally recommended that food policy staff should report to the city government, specifically to the Director of Social Planning, a decision contested by community members of the VFPC, who felt that this city-centric arrangement would compromise their status and their voice in the new food governance system. This tension 'reflects the risk of governmental actors remaining powerfully determinant in partnership processes and outcomes in spite of claims of equal participation and input' (Mendes 2008: 955).

In both Toronto and Vancouver, the success of the food policy councils is seen to depend not on a zero-sum power struggle between city government and civil society, but rather on a judicious combination of 'top-down' support from the key institutions of the city government allied to the 'bottom-up' energies of civil society. This has been aptly described as 'sharing the burden of reform', where municipal food policy is concerned (Mendes 2008: 953).

Although food policy councils have not (yet) taken off in Europe as they have in North America, municipal food policy is taking off in other ways, partly in response to top-down global initiatives like *Local Agenda 21*, which encouraged locally based initiatives to promote sustainable development; partly in response to bottom-up