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SUSTAINABLE URBAN AGRICULTURE AND FOOD PLANNING

Edited by ROB ROGGEMA

ROUTLEDGE STUDIES IN FOOD, SOCIETY AND THE ENVIRONMENT

Sustainable Urban Agriculture and Food Planning

As urban populations rise rapidly and concerns about food security increase, interest in urban agriculture has been renewed in both developed and developing countries. This book focuses on the sustainable development of urban agriculture and its relationship to food planning in cities.

It brings together the best revised and updated papers from the Sixth Association of European Schools of Planning (AESOP) conference on Sustainable Food Planning. The main emphasis is on the latest research and thinking on spatial planning and design, showing how urban agriculture provides opportunities to develop and enhance the spatial quality of urban environments. Chapters address various topics such as a new theoretical model for understanding urban agriculture, how urban agriculture contributes to restoring our connections to nature, and the limitations of the garden city concept to food security. Case studies are included from several European countries, including Bulgaria, France, Germany, Italy, Netherlands, Romania, Spain, Turkey and the United Kingdom, as well as Australia, Canada, Cameroon, Ethiopia and the United States (New York and Los Angeles).

Rob Roggema is Owner/Director of Cittaideale, Research Office for Adaptive Planning and Design (www.cittaideale.eu) in Wageningen, the Netherlands. He is also Adjunct Professor of Planning with Complexity at the Centre for Design Innovation, Swinburne University of Technology in Melbourne, Australia. He is Director of the Regional Resilience Research Institute, a global institute to help regions becoming more resilient, physically, socially and mentally. Until 2015 he was Professor of Design for Urban Agriculture.

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Sustainable Urban Agriculture and Food Planning

Edited by Rob Roggema

Routledge
Taylor & Francis Group
LONDON AND NEW YORK

earthscan
from Routledge

First published 2016
by Routledge
2 Park Square, Milton Park, Abingdon, Oxon OX14 4RN

and by Routledge
711 Third Avenue, New York, NY 10017

Routledge is an imprint of the Taylor & Francis Group, an informa business

British Library Cataloguing-in-Publication Data
A catalogue record for this book is available from the British Library

Library of Congress Cataloging in Publication Data
Names: Roggema, Rob, editor.
Title: Sustainable urban agriculture and food planning / edited by Rob Roggema.
Other titles: Routledge studies in food, society and environment.
Description: London ; New York : Routledge, 2016. |
Series: Routledge studies in food, society and environment | Includes bibliographical references and index.
Identifiers: LCCN 2016004013| ISBN 9781138183087 (hbk) | ISBN 9781315646039 (ebk)
Subjects: LCSH: Urban agriculture. | Sustainable development. | Food security.
Classification: LCC S494.5.U72 S86 2016 | DDC 630.9173/2—dc23LC record available at https://lccn.loc.gov/2016004013

ISBN: 978-1-138-18308-7 (hbk)
ISBN: 978-1-315-64603-9 (ebk)

Typeset in Bembo
by FiSH Books Ltd, Enfield

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Notes on contributors

Kumru Arapgirlioğlu PhD, City and Environmental Planner, Bilkent University, Department of Urban Design and Landscape Architecture.

Deniz Altay Baykan PhD, City and Regional Planner, Bilkent University, Department of Urban Design and Landscape Architecture.

Roseline Njih Egra Batcha Department of Geography, University of Yaounde 1, Cameroon.

Steven Buchanan Researcher, Alfred State College, State University of New York.

Grit Bürgow Research and Development coordinator ROOF WATER-FARM, Dep. Urban Design & Urban Development, Institute of Urban & Regional Planning (ISR), Berlin Institute of Technology – TU Berlin.

Joy Carey Independent Consultant in Sustainable Food Systems Planning, and Director of Bristol Green Capital Partnership, Bristol UK.

Natalie A. Hall Researcher, Queens University Belfast.

Bernard Hubert Senior Scientist at INRA and Professor at the EHESS.

François Jégou Director of Strategic Design Scenarios and professor at ENSAV La Cambre Brussels, Belgium.

Andy Jenkins Researcher, Queens University Belfast.

Greg Keeffe Professor of Sustainable Architecture, Queens University Belfast.

Anna Chiara Leardini architect, co-founder of viÆmilia, chef at EVVIVA restaurant, Riccione, Italy.

Howard Lee Lecturer in sustainable agriculture at Hadlow College, Kent, UK; member of Editorial board of International Journal of Agricultural Sustainability.

Angela Million, née Uttke Head of Coordination ROOF WATER-FARM, Chair-holder for Urban Design & Urban Development at the Institute of Urban & Regional Planning (ISR), Berlin Institute of Technology – TU Berlin.

Tal Alon-Mozes Faculty of Architecture and Town Planning, Technion, Israel Institute of Technology.

Natalia Mylonaki Natalia Mylonaki Design Studio.

Claude Napoléone Scientist on economy at the French National Institute for Agricultural Research (INRA).

Rob Roggema Cittaideale, Research Office for Adaptive Design and Planning, Wageningen, the Netherlands and Adjunct Professor Planning with Complexity, Centre for Design Innovation, Swinburne University of Technology, Hawthorn, Australia.

Esther Sanz Sanz PhD candidate on urban studies at the Advanced School for the Social Sciences (EHESS, France) and on geography at the Autonomous University of Madrid (UAM, Spain).

Laura Sasso PhD candidate in Advanced Research in Urban Systems (ARUS) at the University of Duisburg-Essen.

Stefano Serventi Architect, co-founder of viÆmilia, Architect at Global Arquitectura Paisagista, Lisbon, Portugal.

Anja Steglich Research and Communication Coordinator, Department of Urban Design & Urban Development, Institute of Urban & Regional Planning (ISR), Berlin Institute of Technology – TU Berlin.

Bauke de Vries Department of the Built Environment, Eindhoven University of Technology, the Netherlands.

Tom Veeger Department of the Built Environment, Eindhoven.

Arnold van der Valk Full Professor of Land Use Planning at Wageningen University, the Netherlands and University of Technology, the Netherlands.

Maarten Willems Department of the Built Environment, Eindhoven University of Technology, the Netherlands.

Joshua Zeunert Lecturer at Deakin University, Australia.

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1 Introduction

On the brink of why and how: sustainable urban food planning grows up

Rob Roggema

Introduction

In recent years many books on urban agriculture, urban farming, food planning or food systems have been published (De Zeeuw and Drechsel, 2015; Miazzo and Minkjan, 2013; Roggema and Keeffe, 2014; Viljoen and Bohn, 2014). However, this book *Sustainable Urban Agriculture and Food Planning*, marks a shift in perspective. Many discussions and the majority of the research in the past dealt with food safety and security. This book looks beyond these 'why' questions of the food issue, as the questions of 'how' to produce enough, healthy, sustainable and acceptable food close to where it is consumed and where it can be experienced, become more and more important.

Trends

Several trends regarding local and regional production of food can be identified: the scale of urban agriculture, the role of developing countries, the spatial impacts and conditions, the design outcomes, the availability of space, new concepts and new roles for the consumer.

Thinking at the city region scale

Several food-planning scales are currently used to determine the growth of food in or near urbanised areas (see Table 1.1):

1 The city region food system encompasses the complex network of actors, processes and relationships to do with food production, processing, marketing and consumption that exist in a given geographical region that includes a more or less concentrated urban centre and its surrounding peri-urban and rural hinterland – a regional landscape across which flows of people, goods and ecosystem services are managed (FAO and RUAF, 2015).
2 Food system planning is seen as an urban system (Pothukuchi and Kaufman, 1999), however the local scale is not the only scale to look at the food system (Born and Purcell, 2006), as the system is scalable, and can be analysed at higher scales, even global.

3 Urban Agriculture is defined as:

> an industry located within (intra-urban) or on the fringe (peri-urban) of a town, an urban centre, a city or metropolis, which grows or raises, processes and distributes a diversity of food and non-food products, reusing mainly 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, 1999)

Urban farming is the growing, processing and distribution of food or livestock within and around urban centres with the goal of generating income (Poulsen and Spiker, 2014; Thoreau, 2010).

Street food is ready-to-eat food or drink sold in a street or other public place, such as a market or fair, by a hawker or vendor, often from a portable food booth, food cart or food truck (Simopoulos and Bhat, 2000).

A street vendor is a person who offers goods or services for sale to the public without having a permanently built structure but with a temporary static structure or mobile stall (or head-load). Street vendors could be stationary and occupy space

Table 1.1 Types of urban food production and their typical scale

Type	*Definition*	*Scale*
City region	A more or less concentrated urban centre and its surrounding peri-urban and rural hinterland	Regional landscape
Food system planning	Planning of the food system at the urban or the local scale. The system is scalable	Urban region
Urban agriculture	Agriculture within (intra-urban) or on the fringe (peri-urban) of a town, an urban centre, a city or metropolis	Urban and peri-urban
Urban farming	Farming within and around urban centres	Urban centres
Street food	Food sold in a street or other public place	Street, public/private space
Street vendor	Person selling food on the pavements or other public/private areas, or mobile	Pavement, public area
Community garden	Shared productive land in neighbourhoods, schools, connected to institutions such as hospitals, and on residential housing grounds	Piece of land in neighbourhood

Source: Roggema and Spangenberg (2015)

on the pavements or other public/private areas, or could be mobile and move from place to place carrying their wares on push carts or in cycles or baskets on their heads, or could sell their wares in moving buses (MHUPA, 2004; Sundaram, 2008).

Community garden/consumer collectives: a community garden is any piece of land gardened by a group of people, utilising either individual or shared plots on private or public land. The land may produce fruit, vegetables and/or ornamentals. Community gardens may be found in neighbourhoods, schools, connected to institutions such as hospitals, and on residential housing grounds (University of California, undated).

Despite an increase in local low-scale urban farming projects, such as rooftop gardens, community gardens and mobile street food entrepreneurs, a general trend to start looking at the food system at the city-region scale is visible. For instance the work of FAO/RUAF (Food and Agriculture Organization of the United Nations/Resource Centres on Urban Agriculture and Food Security) (FOA and RUAF, 2015) and IUFN (International Urban Food Network) (Jennings *et al.*, 2015) makes clear that at this level the gains in terms of sustainability, health and efficiency could be large. At this scale the urban metabolism, or the flows of resources inside and outside of the food system, is an important issue and is very promising.

Many of the chapters in this publication emphasise the city region (Chapters 3: Leardini and Serventi; 4: Van der Valk; 5: Sanz Sanz *et al.*; 6: Keeffe *et al.*; and 14: Batcha) or food system (Chapters 2: Keeffe; 3: Leardini and Serventi; 4: Van der Valk; 6: Keeffe *et al.*; and 15: Lee) scales. The urban agriculture (Chapters 2: Keeffe; 7: Zeunert; 8: Mylonaki; 11: Kumru Arapgirlioğlu and Altay Baykan; and 12: Sasso) and urban farming (Chapters 2: Keeffe; 4: Van der Valk; 9: Million *et al.*; and 10: Buchanan) scales are also widely used in this book, while street food and vendors (Chapter 16: Jégou and Carey, regarding intermediate entrepreneurs sale in schools and land markets) and community gardens (Chapter 4: Van der Valk; and 13: Tal Alon Mozes) are only sparsely mentioned (see Table 1.2).

Table 1.2 The scales discussed in the different chapters of this book

Scale	*Chapters*
City region	3 (Leardini and Serventi), 4 (Van der Valk), 5 (Sanz Sanz *et al.*), 6 (Keeffe *et al.*), 14 (Batcha)
Food system	2 (Keeffe), 3 (Leardini and Serventi), 4 (Van der Valk), 6 (Keeffe *et al.*), 15 (Lee)
Urban agriculture	2 (Keeffe), 7 (Zeunert), 8 (Mylonaki), 11 (Kumru Arapgirlioğlu and Altay Baykan), 12 (Sasso)
Urban farming	2 (Keeffe), 4 (Van der Valk), 9 (Million *et al.*), 10 (Buchanan)
Street food	16 (Jégou and Carey)
Street vendor	16 (Jégou and Carey)
Community garden	4 (Van der Valk), 13 (Tal Alon Mozes)

The role of developing countries

In Dar es Salaam and Nairobi, just to name a couple of cities in developing countries, the growth of food in urban areas and slum areas is a common phenomenon (Conway, undated; Foeken and Mwangi, undated; Foeken *et al.*, 2004; Jacobi *et al.*, undated; Kenyan Ecotourist, 2012; Lee-Smith, 2013; Mayoyo, 2015; Schmidt, 2011). Increasingly it becomes clear that these cities should not only be seen as places where urban farming methodologies and techniques developed in developed countries could be implemented, but these cities have a large experience in organising, implementing and growing food close to the consumers. Besides the still-necessary support for the poorest people in arranging their local food supply, including set up of urban agriculture projects, these cities should also be approached as a knowledge base to learn from. The experiences in Dar es Salaam and Nairobi are widespread, as several chapters in this publication illustrate. Especially in Chapter 13, Batcha discussed the situation in Cameroon.

Spatial impacts and conditions

In urban agriculture specific fields of research have been distinct. There is a huge body of knowledge about the resource efficiency and environmental performance of urban agriculture projects (Allen, 2003; Deelstra and Girardet, 2000; Mougeot, 2010), and at the same time many scholars have studied the social impacts of these projects (De Bon *et al.*, 2010; Mougeot, 2010; Nugent, 2000) or their sustainability (Koc, 1999; Pearson *et al.*, 2010; Smit *et al.*, 1996). So far, these topics have mainly been looked at from a sectorial perspective. In the current timeframe there is an increase in studies and projects that observe urban agriculture from one integrated frame. The studies carried out in Rotterdam for instance show the integration of spatial needs of urban food production with the spatial conditions and potentials in the city (De Graaf, 2011). Four types of urban agriculture (forest gardening, small plot intensive farming (SPIN), roof hydroponics and aquaponics) are matched with the potentials and constraints (soil, water, heat islands and organic waste) in the city, which leads to an integrated vision on the chances for urban agriculture in Rotterdam (see Figure 1.1) though the number of factors and types is limited.

What can be distinguished is that the approach to urban agriculture is increasingly integrating different topics into one frame. In such a frame (see Figure 1.2) design aspects (scales, design principles, concepts and strategies, potentials, existing spatial structures and patterns), environmental parameters (urban metabolism, flows of water, nutrients and energy) and economic (business models), social (inclusion, cohesion) and agricultural (productivity) factors are factored in the framework (Roggema, 2014).

The framework illustrated in Figure 1.2 consists of two halves. To the left hand side the agricultural productivity aspects are located. The productivity depends on the demand (size of population, diet), the feasibility of crop types and the economic system. These three factors determine the agricultural system. To the right of the

Figure 1.1 Opportunity map: room for urban agriculture in Rotterdam
Source: Paul de Graaf Research & Design (2011).

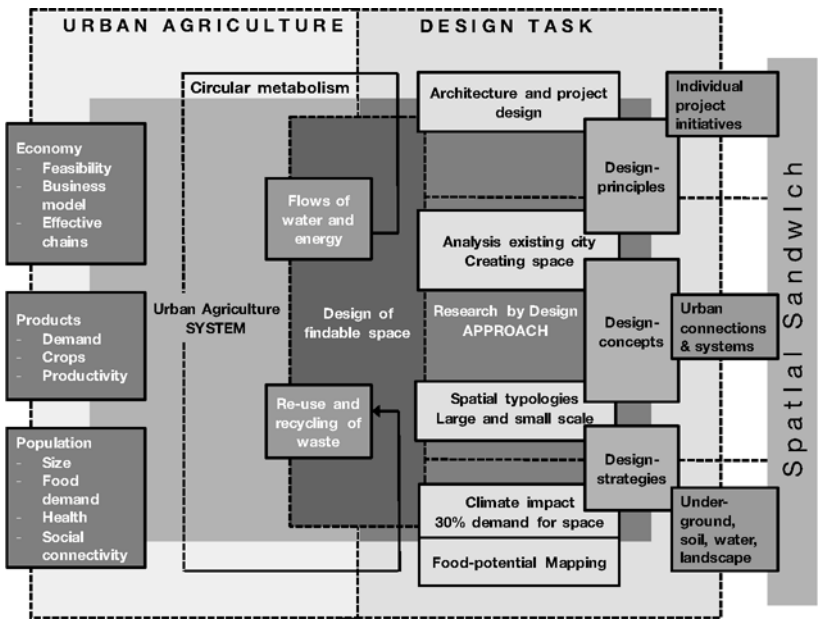

Figure 1.2 Integrated framework for urban agriculture
Source: Roggema (2014).

framework the design tasks are located. These tasks are divided in three levels of scale. Some of the tasks are effective at a strategic level. Here we are talking about the food potentials of a certain area, which may be under the influence of climatic impacts. The underground, soil, water system and the landscape determine the potential to grow food. Design strategies are effective at the city-region level. The design concepts are effective at the urban level. Spatial typologies and existing spaces determine the type of urban agriculture projects that can be implemented at this level. Urban patterns and structure determine the design. The lowest level is the design principle, which is effective at the project level. For park and garden designs these spatial principles are used to create a concrete design.

The two halves are connected with each other through the flows of energy, resources and water, which work both in the agricultural system as well as in the designs at several levels. The design and planning of the circular metabolism allows us to find spaces and locations where best to grow food in urban environments. The availability of flows of water, energy and nutrients for instance is necessary to grow food in places that are identified through design at different scales. At the same time, the availability of these resources is essential to meet the economic and food demands of the regional population. The regional agricultural system cannot function without sufficient resources. Therefore, the design and identification of spaces for food are only effective when supplied with these resources and this makes it possible to supply food for the local demands. Working in this framework helps to create vision and design in an integrated and holistic way. This implies that when the framework is used there is a greater chance that more food that is demanded can be produced locally.

Several chapters in this publication emphasise the need for developing a spatial systemic framework for including the growth of food in our urban environments. Keeffe proposes to think in terms of the hardware software interface in Chapter 2, Sanz Sanz *et al*. describe a GIS-based methodological approach for typecasting food production in peri-urban areas (Chapter 5) and Keeffe *et al*. (Chapter 6) use the Garden City model of Ebenezer Howard to identify spaces for food production.

Design outcomes

Another visible trend in discussing food production in urban areas is the increase of design-led projects. The importance of a good design was often underestimated, but in recent years the numbers of valuable design contributions to the discourse is increasing. In this publication the Chapters 2 (Keeffe), 3 (Leardini and Serventi) and 8 (Mylonaki) illustrate this development. The four designs that were developed during the Sixth AESOP (Association of European Schools of Planning) conference on sustainable food systems (see Figure 1.3) show the transformation of intense urban environments into food-0producing areas (Roggema, 2015a).

The design for the so-called Smaakpark in Ede (see Figure 1.4) illuminates a new concept for experiencing food in many different ways: as consumer, producer, holidaymaker, playground, wedding place and cooking studio and restaurant.

And there are many others, such as the Zuidpark in Amsterdam, where food

Figure 1.3 Four designs for intensive productive urban landscapes in Groningen, Veghel, Amsterdam and Leeuwarden

Source: Roggema (2015a).

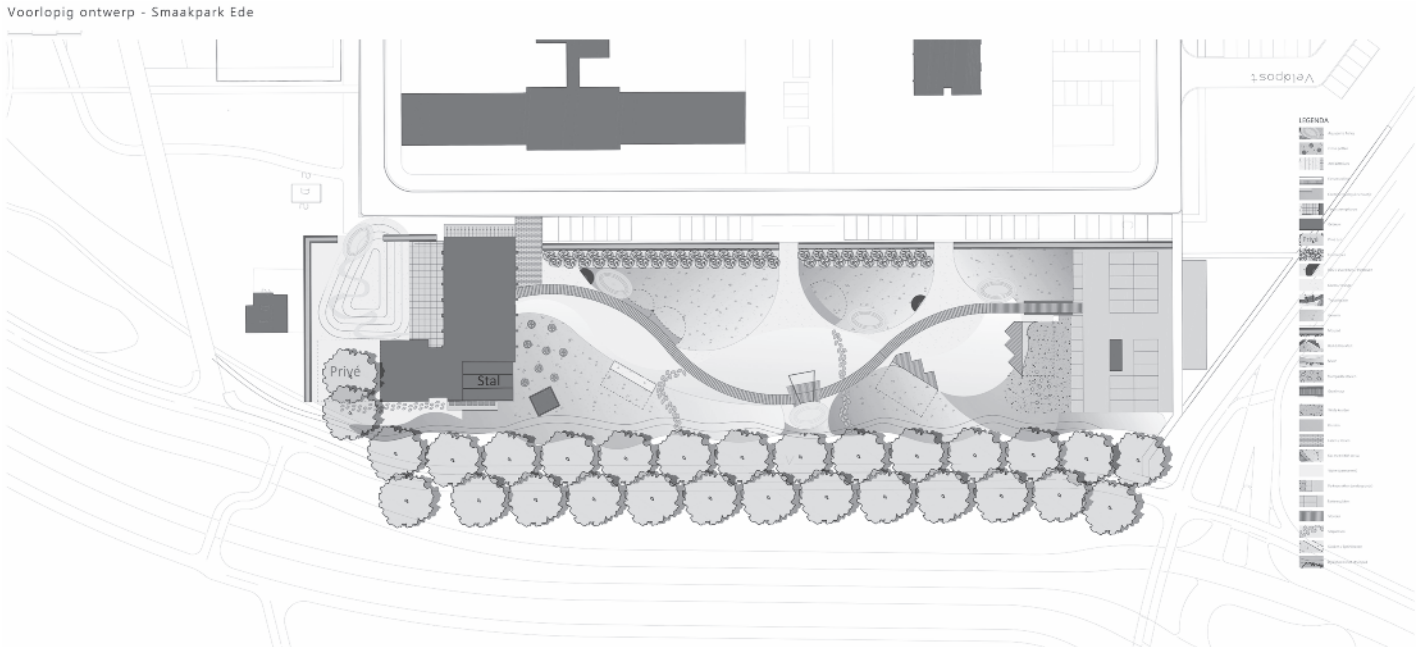

Figure 1.4 Design for Smaakpark Ede

Source: Weij *et al.* (2016).

grows in an office environment, the food forest in the surroundings of Vlaardingen and the design for the Floriade area in Almere (see Figure 1.5).

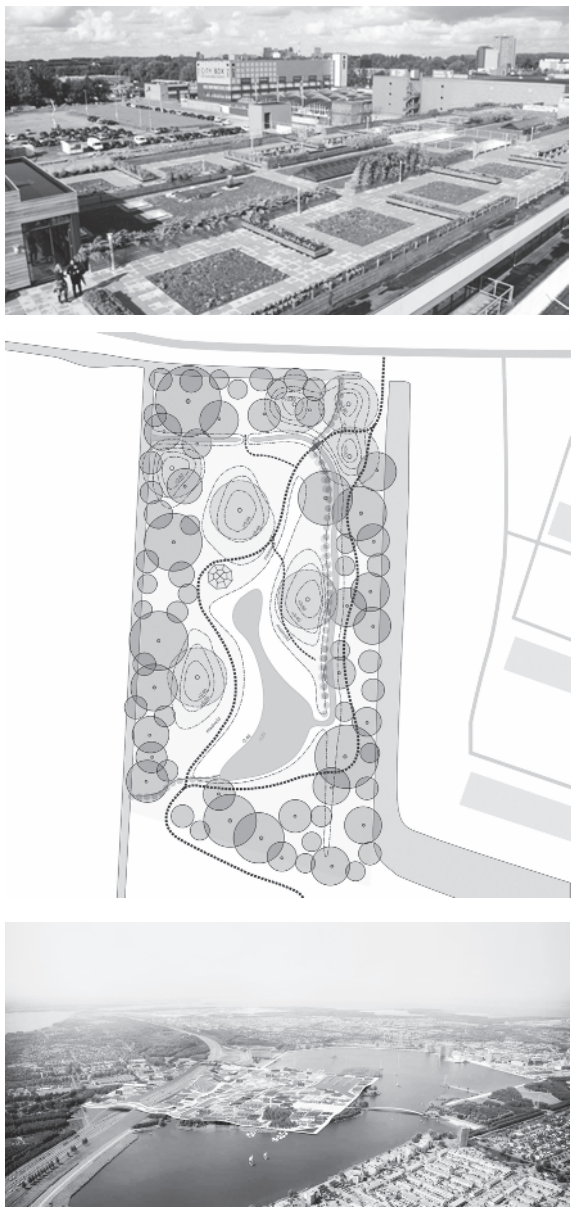

Figure 1.5 The Zuidpark in Amsterdam, Food Forest Vlaardingen and the Floriade in Almere

Source: Food Forest Vlaardingen from Paul de Graaf Research & Design/Rotterdam Forest Garden Network (2015); Floriade in Almere ©MVRDV.

Is there enough space available?

There is an increasing debate about the question whether there is enough space for growing food in the city. Many initiatives in urban areas have been realised, but when we calculate the real impact on the food supply within urban boundaries a tiny 0.002 per cent of food consumption can be produced (Roggema, 2014, 2015b). This can be seen as a weak performance. Of course there are many other reasons to grow food in the city. For instance environmental benefits or social connectivity are important factors. But when the contribution to food supply is close to zero, the question of whether there is enough space available is valid. Not much research is focusing on this subject yet. For the Amsterdam area, recent research found that 12.5 per cent of the surface area (without counting roofs, valuable ecological spaces or private areas) of the city is easily transformable into food productive space. This could provide 25 per cent of the population of Amsterdam with vegetables, herbs and fruits (Mulder and Oude Aarninkhof, 2014). When we take this result and include the potential of roofs, underground spaces, private areas and space inside buildings, the number could be raised to 90 per cent (Roggema, 2015b). However, this implies a diet of vegetables and fruits. The different diets and their spatial consequences is nicely illustrated by comparing Howard's Garden City model in Chapter 6 (Keeffe *et al.*).

New food experiences

In addition to the growth of food and its distribution to the consumers, food is increasingly seen as an experience. This includes the design of food, food safaris, pop-up restaurants, food festivals such as the capital of taste (see www.puur-e.nl) or neighbourhood food nights, such as in east Amsterdam (see www.foodnight.nl) and many others. In this publication, Chapter 10 (Buchanan) gives insights in the possibilities for new experiences in the fields of education and recreation in Queens, New York.

The role of the consumer

A last trend to be signalled is the new role the consumer often takes up. In the recent past the consumer only consumed the food, which was on offer in the supermarket. There was hardly any other option than to buy food and cook it at home or eat food in a restaurant. Now consumers maintain public food gardens, harvest the produce and cook it at home. Examples of this are the *pluktuinen* (pick-gardens), such as Pluktuin de Bosrand in Wageningen (www.pluktuindebosrand.nl) or Pluktuin De Kruudhof in Halle (http://dekruudhof.nl). Also, consumers can eat fresh food from locally produced and cooked food, such as offered by street food vendors (Boer Geert, Vleesch noch Visch (www.vleeschnochvisch.com) and Tho Vietnamese Loempia's). The third new role for consumers is when they take up the role of (professional) producer. The consumer is also an entrepreneur and capable of delivering agreed amounts and qualities of produce to restaurants, street

vendors or (super)markets. In Chapter 15, François Jégou and Joy Carey explore the new intermediate role in between consumers and producers.

Proposition: a new definition

As becomes clear in the trends described above, food planning is entering a new stage of its development. Instead of conducting the discussion about the necessity to provide safe and secure food, this stage is putting at its centre how to enjoy and produce healthy and environmentally friendly food. The attention on the larger urban and regional scales and the design approaches emphasises the tactile and conceptual spatial side of urban food planning, including discussion about the availability of sufficient spaces in the city to grow food. The knowledge available in developing countries, the changing role of consumers and the trend of food experiences all imply social interactions in actively cultivating crops in sometimes confined places in urban regions. The latter trends are also focusing the debate on how to grow and enjoy food production, rather than problematising the issue. Therefore, the chapters in this publication altogether give reason to adjust the definition of food planning to become:

> *Food planning provides the spatial conditions to produce and experience enough, sustainable, healthy and acceptable food*

This new definition consists of the following ingredients:

Spatial conditions: Food planning should create, design and safeguard the spatial possibilities to grow food in amounts that roughly meet the demands of the urban population, at least for the vegetable, herb and fruit components of the food pallet.

Produce and experience: Food planning should provide the places where food can be produced, but also where it can be experienced. Therefore food spaces must be productive (a wide range of fruits, vegetables and herbs can be grown) and at the same time accessible for co-producers, tourists and consumers to enjoy the production, maintenance, harvesting, cooking and consumption of local food.

Enough: Food planning should arrange available spaces to produce the produce that the local urban population demands.

Sustainable: Food planning should create the spatial coherence in food production that makes it possible to reuse and recycle resources (energy, water) and materials (nutrients, waste) in the production process, and arranges a connected system with short transport links.

Healthy: Food planning provides the possibility to produce food without using pesticides and other artificial products, and offers fresh food at close distances.

Acceptable: The food planning system provides food that is sustainable, but also culturally responsible. In times of migration the cultural mixes in the population are increasing the range of food diets, menus and crops produced. Food planning

needs to offer the opportunities for each of the cultural demands to deliver the specific produces. Food, cooking and eating is an important basis for sharing cultural differences and joining a common world.

Conclusion

In this book a range of chapters are written about food planning. Coming from a range of directions, the common message of these chapters is a positive one: if we change the way we produce food we are capable of providing food for everyone in a sustainable and enjoyable way. Each of the chapters contributes to thinking of solutions for the current food issues, without becoming too theoretical. The stories incorporate a hands-on attitude to discovering how to grow food in a sustainable way, close to where it is enjoyed.

The trends mentioned above mark a shift towards constructive thinking in food planning. This shift is just starting and requires further research, practical projects and continuous knowledge exchange between consumers, researchers, producers, practitioners and policymakers. This is necessary because the current amounts of food grown within or close to urban environments are still not sufficient to feed a reasonable part of the population. The available space in the city, yet undiscovered, needs to become visible and take up a role in the food system. As long as we only trust in large-scale, efficient yet unsustainable productive agriculture, the major food issues will not be solved in the long term. It is necessary to develop city-regional food systems in which a large number of beautiful productive spaces are designed that are capable of growing food for the majority of the population. If this book can contribute to realising these city-region food systems all over the world it has reached its goal.

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