

## Urban green infrastructures in Europe: new architectural orientations for finding a way out of the dead-end road of industrialized modernity

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### Abstract

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Historically cities and urban green infrastructures showed a diverse and dynamic character. The rise of urban agriculture is increasingly embedded in urban practices that aim to fashion a more sustainable and healthy city-region and food provisioning food system. This invites to rethink city-spaces and analyze grassroots dynamics as the spatial interweaving of densely populated urban centres and green open space, which represent actively, socially constructed functionalities and multi-spatial connectivity. Developing and implementing integrated policies to support these new practices is a major challenge.

**Keywords: Urban agriculture, policy challenges, spatial design strategies, sustainability**

### 1. Introduction

The modernization and industrialization of agricultural food production has safeguarded food supply at low direct payment for food products by consumers (Tracy, 1989; Brouwer and Lowe, 1998). However, it has resulted in the undeniable degradation of natural resources that are crucial to agricultural production (Altieri, 2002; Toledo, 1990; 2002). Furthermore a series of agricultural crises such as mad cow disease, food and mouth, avian influenza, swine fever and blue tongue disease has significantly increased societal concerns about the industrial nature of current livestock production systems (van der Ploeg, 2006). These indicate that the contemporary globalized food system is in a major environmental and socio-cultural crisis.

Theoretical frames that draw upon literature from outside the agro-food system but that are intended to contribute to its restructuring are characterized by “an inadequate architecture for analyses of change in agro-food production structures and rural socio-spatial organization” (Goodman, 1997), especially since these frames often do not

take into account the complexity of the agro-food system. Globalizing food chains, next to being criticized for lacking socially and ecologically inclusiveness cause vulnerability of city-regions in terms of food security. Since total security is difficult to reach, the improvement of resilience of city-regions to food scarcities increasingly wins interests. This is, for instance, symbolized by the 2013 Bonn Declaration of Mayors at the 4<sup>th</sup> Global Forum on Urban Resilience and Adaptation: “We invite local governments to develop and implement a holistic ecosystems-based approach for developing city-region food systems that ensure food security, contribute to urban poverty eradication, protect and enhance local biodiversity and that are integrated in development plans that strengthen urban resilience and adaptation”. Hence, sustainable food systems not only include the provision of food security but also landscapes, farm-land biodiversity, soil life and stability, the availability of water, water and air quality, resilience to fire, and rural vitality (Cooper *et al.*, 2009).

Wiskerke (2009) distinguishes two competing paradigms in meeting sustainability goals: the

agro-industrial food paradigm that is anchored in the modernization, industrialization and globalization of the food system (Murdoch *et al.*, 2000; van der Ploeg, 2003) and the integrated territorial paradigm (Marsden, 2003) that anchors in re-localized food systems (McDonagh *et al.*, 2014). While the agro-industrial food paradigm is characterized by a minor deviation of modernization (Wiskerke, 2003; Lamine *et al.*, 2012) in the integrated territorial paradigm food systems continuously “reconfigure the boundaries between political action and consumption, between public organisations and business, and between citizenship and private interests and lay actors and experts” (Brunori *et al.*, 2011). Thereby the boundaries of what is conceptualized as “territorial” might be discussed, and globalized influences and material flows might be included or interrelated to the locally provided food and other ecosystem services. Following Bolund and Hunhammar (1999) these include supporting services (nutrient dispersal, biodiversity, seed dispersal), provisioning services (production of food, fibre, fuel, pharmacy), regulating services (erosion prevention, air quality regulation, climate control, waste decomposition) and socio-cultural services (non-material benefits: recreational values, community building, aesthetic qualities).

In recent years there is a resurgence of interest in ecosystem services in the urban realm (Barthel *et al.*, 2010; Bendt *et al.*, 2013; Colding and Barthel, 2013), particularly as urban green infrastructure is considered to be an import means to deliver multiple sustainability and health benefits to the urban population (Forster and Getz Escudero, 2014). This (renewed) interest in ecosystem services is related to the changing nature of urbanization over the last few decades.

## **2. Urbanization, industrialization and the urban-rural divide**

Industrial modernity emerged in a binary form: the division of the world into the rural and the urban, and the subsequent association of these separate domains with particular economic activities, social relations and policies (Marsden *et al.*, 1990; Mormont, 1990; van der Ploeg, 2008). It is important to consider that creation of a rural/urban binary in which the rural was defined in terms of non-urban and the urban in terms of non-rural was a novel development. In the pre-modern period, city and countryside had not been sharply separated. Large towns continued to engage in rural activities up to the 18th century with their inhabitants often spending parts of their lives in the fields, while the countryside was often the seat of craft activities found also in urban areas (Braudel, 1979; Jongerden, 2007). Yet the division between the rural and the urban became a main

characteristic of sociology and economics, the social sciences of modernism, and to such an extent that these fields of knowledge became separated themselves into rural and urban sociology and economics.

In ‘The Principles of Rural-Urban Sociology’, two of the founders of rural sociology, Sorokin and Zimmerman, argued that, “*rural society is composed out of a totality of individuals actively engaged in an agricultural pursuit*” (Sorokin and Zimmerman, 1929). Rural society, it was posited, usually does not transform grain into bread or cotton into cloths. Such occupational activities may be present, but they do not comprise the principal means of obtaining a livelihood. Therefore, rural sociology is in the first place the social study of an occupational group, namely, of those working in agriculture (*ibid*). Though it has been recognized that rural residence does not imply farming as the only means of livelihood, this was rendered as irrelevant. Though it has been argued that rural residence does not imply farming as the only means of livelihood, pluri-activity<sup>1</sup> was ignored (Nelson, 1955; Bernstein *et al.*, 1992) and only emerged in recent years in debates about the future of agriculture and wider relations with society (Renting *et al.*, 2008). In the course of the 19th and 20th centuries, “*industry*” became ascribed to the urban, and “*agriculture*” to the rural. Though not an empirical reality, the twinning of industry-urban and agriculture-rural became part of the discourse of policy makers.

The imagination and social construction of the urban and the rural as seats of particular, distinct economic activities have major policy consequences (Jongerden, 2008). Importantly, it narrows the idea of development. The city was defined in terms of non-rural and non-agriculture, and throughout the world we have seen policies oriented towards pushing agriculture out of the city. Since agriculture was considered to define the rural, development policies and practices focused on agriculture. Though separated as entities, a process of industrialization, which was thought to have infused the city with a “*modern*” spirit, was also supposed to infuse the rural. The image and aspirational end-state of modern agricultural production was that of large industrial and high-tech holdings, run by entrepreneurial farmers, competing in world markets (van der Ploeg, 2003; Hardt and Negri, 2004). This industrialization of agriculture was perceived as the main strategy for development, now termed “*agri-business*”. Peasant and peasant production systems, often marked by pluri-activity, were

<sup>1</sup> Forms of pluri-activity include wage labour, either seasonal or part-time, or some form of self-employment, such as small scale processing, petty trade, handicraft production, or the combination with farming with tourism, or relief and care work.

either disqualified or regarded just as an escape route out of backwardness (van der Ploeg, 2008).

### 3. Modern urban narratives and space-time compression

Wiskerke (2007) observes and summarizes a change in the nature of urbanization: instead of at the level of the sector or the rural, the regional level becomes the locus of development and policymaking. Wiskerke's observation implies that the city "*urbanizes hitherto un-urbanized worlds*" and no clear fault lines can be discussed; a spatial setting is emerging in which the rural and the urban are merging together. Merrifield (2011) adds to this that rural places are becoming part of post-industrial society. This encourages us to reflect on the planning, design and governance strategies of cities and metropolitan regions aimed at preserving and creating spaces for delivering food and ecosystem services.

In recent years we are witnessing a growing understanding of the importance of a green urban infrastructure in adapting to and mitigating climate change (reducing urban heat islands, storm water containment), in improving the urban climate, in providing spaces for education and leisure, in preserving biodiversity and in providing fresh and healthy food (Morgan and Sonnino, 2010; Viljoen and Wiskerke, 2012; Forster and Getz Escudero, 2014). In Europe, urban agriculture (UA) integrates multiple functions in urban and peri-urban areas (Renting, 2013; Anderson *et al.*, 2014), and governance dynamics increasingly address local food production, biodiversity and aesthetical landscape aspects. In many cities urban agriculture is on the rise for a variety of reasons: reconnecting to food provisioning, alternative use of vacant building lots, community building, educating children about growing and cooking food, greening neighbourhoods and recycling urban waste (Viljoen and Wiskerke, 2012; Morgan, 2014). The rise of UA is increasingly embedded in urban practices that aim to fashion a more sustainable and healthy city region and food provisioning food system, which therefore should be widened to urban and peri-urban agriculture and forestry (UPAF), which is increasingly embedded in urban policies that aim to fashion a more sustainable and healthy city-region food system. This implies that cities and city-regions are taking up the role of food policy makers, a role that until recently was fulfilled by nation states or even supranational governments, such as the European Commission, primarily by means of a productivist agricultural policy (Morgan, 2014).

The emergence of city-regions as food policy makers not only reflects a decentralization of food policies, but above all an attempt to develop an integrated and territorial approach to food policy (Wiskerke, 2009). Integrated, as urban food

policies not only attempt to enhance the sustainability of food provisioning activities as production, processing, distribution and sales, but above all strengthen the reciprocal relations between food provisioning and climate change, employment, education, social equity, public health and quality of life. These territorial policies are targeted at the place-specific characteristics of the food provisioning system and its place-specific links with the other aforementioned policy domains.

Developing and implementing integrated and territorial food policies is a challenging and difficult process. First and foremost because food has until recently never featured on the urban policy agenda. Food was considered to be equal to agriculture and thus confined to the rural policy domain. This also implies that there is no municipal or regional department capable of taking up the responsibility for food and we often see that, depending on the food-related challenges of a city-region, that this role is fulfilled by the health, environment, social welfare or planning department. A second difficulty is that design and implementation of a food policy cannot be done by the municipal government alone, but requires the support of and collaboration with the private sector i.e. food provisioning actors such as producers, processors, traders, food stores, and restaurants, and civil society organizations advocating food system related topics such as public health, environmental protection, animal welfare and social justice. From these difficulties follows the challenge to include food in city-region planning and spatial design. Despite the manifold ways in which food shapes the materiality of the city (Morgan, 2014), food has for a long time remained a stranger to the field of urban planning (Pothukuchi and Kaufman, 2000).

### 4. Spatial design strategies

An interesting and promising approach to overcome this omission in urban spatial design and planning is the Continuous Productive Urban Landscape (CPUL) approach developed by Bohn and Viljoen (2012). This spatial design strategy explores the ways in which productive urban green spaces can contribute to more sustainable and resilient food systems. The CPULs approach seeks to contribute to diminishing the vulnerability to food shortages by creating space for growing food in private and public gardens and land within the city boundary thereby reducing the carbon food print and leading to greater biodiversity and local employment. This concept can be related to the ecological function of landscape elements, which—in order to meet sustainability objectives—should be valorized over "*productivity*" that is central in modern industries

and leads to the degradation of nature and landscape at the global scale.

Instead, the CPUL concept seeks to overcome the urban-rural and society-nature binary divisions by proposing strategies and solutions for preserving, creating and connecting urban and peri-urban green spaces that deliver food and ecosystem services. Connecting green spaces in cities, and thus creating a continuous productive landscape in and through city regions, improves the visibility of the city-region food system and helps to reconnect citizens to agriculture and cities to their rural hinterland (Barthel *et al.*, 2010; van der Schans and Wiskerke, 2012).

As such it as an attempt to move beyond the modernity project in which food was rendered invisible in the urban political arena and a stranger to the urban planning system (Morgan, 2014). Next to the design of urban green infrastructures (Hester, 2006) this brings challenges regarding the adaptation of governance structures in city-regions. A first challenge is to move to a position where “*collaborative*” positions become central and key to the production of integrated and cohesive frameworks. Consultation, negotiation and collective action ask for strategies for the inclusion of the main actors: governments, private entities and citizens. Innovative approaches, such as participatory planning and budgeting, are to be considered as innovative methods for developing a coherent ecosystem approach to governance. Such new repertoires enable to take into account conflicts of interest between various land uses and green infrastructures and simultaneously address these explicitly, while initiating new forms of collaboration between the private, the public and the common. A second challenge is to develop the issue of the commons alongside the private and the public. From governance perspective this brings next to market and state a third coordination mechanisms to the foreground: the management of green infrastructures through “*coordinated collective action and decision-making*” (Ostrom, 1990; Dietz *et al.*, 2003; Ostrom, 2009). A third and final challenge is to strengthen the capacity of social learning in the context of collective actions, and “*organize knowledge processes*” and the building of collaborative learning. In order to enable people to learn together and thereby act as channels for dialogue and cooperation (Nyhan, 2007) operational interfaces are a key (Wellbrock *et al.*, 2013; Wellbrock and Roep, 2014).

## 5. Concluding remarks

Urban green infrastructure, perceived as “*the green space in the metropolitan landscape that produces ecosystem services that are perceived and enjoyed by people*”, lacks sufficient institutions for managing its cultural and

biological biodiversity (Colding and Barthel, 2013). Future research should therefore explore dynamics as the spatial interweaving of densely populated urban centres and green open spaces (van der Schans and Wiskerke, 2012) and frame the functionalities and multi-spatial connectivity of green space and natural systems that are “*actively protected, managed, and in some cases restored*” (Benedict and McMahon, 2006). Empirical evidence of the changing character of the city should inform policymakers and grassroots initiatives about food provisioning practices that contribute to solve environmental problems while simultaneously creating economic benefits and human welfare.

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