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Title	Mending the metabolic rift: Placing the 'urban' in urban agriculture
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Publication date	2016
Original Citation	Dehaene, M., Tornaghi, C. and Sage, C. (2016) 'Mending the metabolic rift: Placing the 'urban' in urban agriculture.', in Lohrberg, F., Licka, L., Scazzosi, L. and Timpe A. (eds.), Urban Agriculture Europe, Berlin: Jovis, pp. 174-177. isbn: 978-3-86859-371-6
Type of publication	Book chapter
Link to publisher's version	https://www.jovis.de/en/books/details/product/urban-agriculture-europe.html
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Download date	2026-11-15 01:03:32
Item downloaded from	https://hdl.handle.net/10468/4830

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Dehaene, M., Tornaghi, C., Sage, C. (2016) Mending the metabolic rift: Placing the 'urban' in urban agriculture. In Lohrberg, F., Licka, L., Scazzosi, L., Timpe, A. (eds) Urban Agriculture Europe. Jovis Publishers, Berlin, pp.174-177.

5.2 Mending the metabolic rift – placing the 'urban' in urban agriculture

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The concept of 'metabolic rift' has its origins in the work of Karl Marx. It was John Bellamy Foster, however, who coined the term as a foundational concept in environmental sociology (Foster 1999, Schneider and McMichael 2010). Marx pointed to "both a rupture in nutrient cycling between town and country and a rupture in the metabolic relation between humans and nature under capitalism" (Schneider and McMichael 2010, 462). The 'rift' describes the disruption of traditional forms of exchange between humans and nature (eg through agriculture and other forms of resource extraction and use) through which people secured their social reproduction. The rise of urbanization alongside industrialization as a consequence of capitalist development is regarded as the basis of this rupture with the past. In this process relations of production and consumption are increasingly (geographically) separated. As a consequence the ecological and nutrient cycles that once maintained soil fertility while minimizing the accumulation of organic waste are severed.

The alienation-disconnection from nature evoked by the image of the rift has many other expressions. One concerns the rise of increasingly sedentary lifestyles that have resulted in diminishing levels of physical activity particularly in the presence of nature. With greater distances separating spheres of human activity, car-based (and public) transportation makes it hard to build exercise outside the home-school-workplace-shops-home nexus. At the same time energy-dense diets have exacerbated the fact that human metabolism is failing to effectively balance energy input-output for many bodies. Consequently, levels of non-communicable disease such as those associated with overweight and obesity have risen alarmingly and governments are increasingly worried about rising healthcare costs. Rayner and Lang (2012) argue that the obesity crisis is simply one amongst many of the complex and inter-connected urban challenges of the twenty-first century.

The metaphor of the metabolic rift exposes the fundamental asymmetry in the relationship between country and town, and has served as the basis of what has been called 'the urban question' (Castells 1977). The reform, regulation, and planning of urban areas under capitalism has been used time and again to remediate this asymmetrical relationship, and to

address the reproduction crisis caused by the process of urban accumulation encompassing the recurrent crises of public health, housing, energy and food security. It is in this context that we discuss urban agriculture as a tool for an alternative urbanism which seeks to qualify and mend the metabolic rift. Urban agriculture, we argue, finds itself at the centre of a deeply political discussion on how the urban question is addressed, to what end, and for whose benefit.

The image of the metabolic rift tends to provoke two counter imaginaries: one which argues for a technocratic fix of broken cycles, restoring an image of a world in which flows are monitored, managed and fully regulated; and the other which builds upon a radical critique of the agro-industrial complex that developed hand in hand with capitalist urbanisation, and which explores pre- and even anti-urban imaginaries. Both positions are present within the urban agriculture debate; however, neither offers a singular solution to 'mending' the metabolic rift.

The true potential of the urban agriculture debate, we would argue, lies in its capacity to promote another line of development, one which embraces the urban as an emancipatory force and situates the power of utopian thinking ('another world is possible') neither in a problem free and technologically resolved future, nor in an imaginary past, but rather carves out localized utopias within the city as the potential seedbeds of an insurgent form of social change. Mending the metabolic rift is not a half-baked proposition which tries to smooth the internal contradictions of the urban. Rather, it is a potentially radical proposition which - without seeking to step outside of the forces of history - seeks to empower communities to take back the urban and to shape it in their own image.

In what follows we first try to place the discussion of urban agriculture within the urban by framing food as an urban question. Secondly, we try to elaborate our understanding of urban agriculture as a tool for an alternative urbanism taking the lead from agroecology. Agroecology presents a potential solution for urban agricultural initiatives in a way that ensures collective, local responsibility over health and nutrient flows that can help to mend the metabolic rift.

Food as an urban question

The city and the process of urbanization exist by virtue of the break between relations of production and consumption. Cities emerged historically as a progressive concentration of functions, arts and crafts, merchants and citizens, disenfranchised from direct intensive self-cultivation of food. Apart from a structural metabolic imbalance, the break between production and consumption in all the spheres of life produces a process of spatial

differentiation and social division of labour and the loss of a potentially emancipatory opportunity for the urban population to benefit from a diverse array of cultural and educational opportunities. Urbanisation, while providing a higher level of food security than in rural areas, has nonetheless progressively separated citizens from food production. Consequently, we seek to explore what models of urbanism might present new emancipatory opportunities through food production that can overcome the legacy of the metabolic rift and the territorial separation of the city and countryside.

The question of food provision in cities has enjoyed great interest over the past decade with research highlighting the extent to which the city depends on increasingly complex socio-technical arrangements in providing food (Steel 2009). Moving to the city, more than ever, subjects people to an urban diet - a supermarket diet - and makes people, as far as their access to food is concerned, dependent on a limited set of options. When it comes to control over resources and different ways of having access to food, the city, rather than multiplying the options seems to radically reduce them. On the one hand, urban environments offer an unprecedented variety of foods, from different cuisines, from faraway places, throughout the seasons. On the other hand it offers this seeming variety through a limited number of channels, controlled by an ever decreasing number of players. This growing hegemony of urban food provision widens the metabolic rift, further alienates people from nature, exacerbates the commodification of food on unprecedented levels and further reduces the control individual citizens have over access to food.

Food provision in an urban context is an integral part of the 'urban question'. By drawing upon this notion in the work of Manuel Castells (1977), we emphasize the extent to which urban populations living within the break between production and consumption are at the mercy of arrangements for 'collective consumption'. Urbanites, in general, are not food producers, but rather consumers: food is one of the services that need to be delivered to them. The urban question, then, stands for the type of collective arrangements that are in place to deliver the services necessary for social reproduction. The urban milieu offers a range of opportunities but also structures the unevenly distributed access to these opportunities. This holds through for the access to housing, for the question of water and energy provision, but also, as we wish to emphasize here, the way in which food is provided for.

Access to collective services is typically a function of people's ability to pay, access to state service and their (remaining) capacity of self-provision (Saunders 1986). This means that some goods and services are provided by the state (i.e. health services and education), but many are not (i.e. food), and must be allocated through the market or other forms of provision.

Because of the failure of the collective arrangements in place, many people live in areas known as 'food deserts' or 'obesogenic environments' and the current politics of austerity has indeed increased the number of urban food insecure populations (over 1 million only in the UK in 2014 according to the Trussell Trust) that, being unable to buy or to grow food for a number of reasons, had to rely on food banks for their survival.

In the introduction we introduced a general framework in order to explore the links between the resources for agricultural production highlighted in the core (Figure 1) and the social-infrastructural processes (within the 'ring' in Figure 1) through which they impact on society (exemplified by the four key emancipatory processes in the outer layer). The relationships described in the diagram are not specific to urban agriculture per se. They apply to agriculture in general as well. By pointing to the metabolic rift and by framing food as an urban question, we begin to explain the importance of qualifying these relationships as urban. The urban frame serves the purpose of questioning the contribution of the relations in the diagram to the way in which the collective interdependence of people leaving in cities is handled and articulated.

Within this perspective, the urban is an inherently ambiguous terrain in which various urbanisms are at work that each qualify the process of urbanization differently. These urbanisms represent the full spectrum between 'parasitic' and 'generative' forms of collective consumption (Merrifield 2014): between strategies that structure the urban as a world of uneven development, inequity and non-choice or alternatively contribute to the fair access to and the even distribution of the city as a collective good. The 'urban', in our perspective, is neither inherently good or bad but rather defines the process and conditions within which concrete possibilities of renegotiating the collective arrangements around the production and consumption of food can be redefined.

Urban agriculture may be understood as a practice contributing to a family of different urbanisms that question the current status quo of urban food, where the process of urbanization cuts people off from mechanisms of self-provision and subjugates them to a global food regime (McMichael 2013) based on intensive, exploitative, polluting and resource-depleting industrial food production. As soon as we begin to reframe the discussion in terms of food justice, food sovereignty (Edelman et al 2014) and political gardening (Certoma and Tornaghi, forthcoming 2015) we look at the possibility of constructing the urban diet differently. This requires us to consider residual or enduring aspects of self-provision (such as gardening and other forms of food growing); the re-localization (or 'reterritorializing') of the urban food market (eg the rise in short food supply chains such as farmers markets);

establishing the notion of social justice and individual rights to food; and to find ways of reconstructing the notion of 'commons' around food, requiring efforts toward decommodification and forms of collective production.

Mending the rift through urban agriculture: an urban agroecology perspective

Given the nature of urbanisation, the collective dependency from food provision, and the (negative) effects on food allocation and health of inefficient and unjust mechanism of food provision, how can we therefore conceive of urban agriculture? There is not just one answer to this question. As we stated above, urban agriculture is a component of a number of alternative visions that are in various stages of execution. Some are more focussed on the re-design of the urban fabric; others with the development of alternative food chains, the preservation of biodiversity or the promotion of public health. Transition Towns (Pinkerton and Hopkins 2009), Permaculture (Whitefield 2011), Continuous productive urban landscapes-CPULs (Viljoen 2005; Bohn and Viljoen 2014), Biophilic cities (Beatley 2010), and Agrarian urbanism (Duany 2011) are amongst some of the models. We take the liberty here to advance a new proposal for an alternative urbanism based on the principles of agroecology, which promise to be particularly suited to help mend the metabolic rift.

While urban agriculture gradually finds its way into the fabric of the city, often through grassroots-led initiatives, and starts to transform urban metabolism (through modifying the diet of community food growers, recycling kitchen waste or realising the agricultural potential of urban green spaces), many of these initiatives remain isolated and residual. Even when economically viable and thriving, they do not necessarily impact on the issues of justice, health, resourcefulness or progressive development. We argue that for these practices to be able to 'mend' the metabolic rift, and contribute to food justice, food sovereignty and other emancipatory goals, they need to be framed within regulatory and conceptual frameworks that deal with both the social and the ecological dimensions. We argue that urban agricultural practices, when embedded within an *urban agroecological* perspective, bear a revolutionary potential: they can mobilise those processes in 'the ring' (Fig 1) to fashion convergence towards an emancipatory society. The agroecological perspective produces a 'utopian' point of reference aimed at radicalizing the urban (agriculture) agenda.

Agroecology has been defined as the application of ecological principles to the study, design and management of agroecosystems that are both productive and natural resource conserving, as well as culturally sensitive, socially just and economically viable (Altieri and

Toledo 2011; Gliessman 2012). An agroecology-informed urban agriculture implies not only the cultivation of urban soil for food production, but most importantly involves taking control of the nutrients, the water, the soil, and the energy (including the sun), needed for plant cultivation. It also implies the sharing and reproduction of knowledge needed to master these processes. In short, it requires sovereignty over knowledge and resources.

An 'urban' agroecology, is not simply an agroecology-informed urban agriculture. It is rather a way of conceiving of a city, its functions, zoning, green infrastructure, and governance, within an agroecological perspective which mark the main rationale for the politics of space, and of the social processes of production and reproduction within the city: it is a model for sustainable urbanisation. The *agroecological city* would be a place where food production is rooted within the community with neighbourhood production sites run by what in the UK are called "Community Interest Companies" (a legal definition for community-owned businesses producing benefits that advance their own development). In the wave of privatisation and dismantling of welfare states justified under the recent recession, this could be a viable way to keep common goods under shared ownership. Here nutrients would be recovered from local waste streams including the organic kitchen waste from restaurants, cafés and households; and other biodegradable wastes (eg grass cuttings) such as those identified by recent research commissioned by Rotterdam City Council. In chapter 5.3 we present some observations on recent experiences and issues arising from such urban circular waste stream initiatives.

An urban agroecology consequently unfolds across the city in a range of spaces: on existing green or agricultural land (that also serve as hubs of knowledge-exchange and grassroots re-skilling); but also a considerable part will likely comprise indoor and outdoor spaces integrated into the existing built infrastructure (such as vertical walls, street verges, rooftops), utilising growing research on the re-purposing of existing and disused industrial infrastructure. Abandoned factories are now becoming important sites for low energy protein production, such as aquaponics, mushroom growing and insect farming. The potential for such initiatives is also being matched by a new creativity in rethinking circuits and currencies of exchange designed to retain value within the local economy.

In conclusion we believe that an urban agroecology offers considerable potential not only to help mend the metabolic rift but to provide the basis of an alternative urbanism and can do so in at least three ways:

1) Localised, neighbourhood-level production offers an optimum scale for closing nutrient cycles through capturing organic wastes and returning these as soil amendments for garden sites while also enabling the community to manage these resources and up-skill through mutual learning and experimentation.

2) By providing a focus on resource sovereignty (MacKinnon and Derickson 2013) that promotes better environmental stewardship but also generates opportunities for employment

3) Recovers the centrality of food as a key dimension of social reproduction and a pivotal point for the redesign of economic relations and ecological models. Engagement with food production reveals the ecological basis of our food needs (Sage 2012) and the exploitative nature of the prevailing model of agri-food provisioning.

Ultimately an urban agroecological perspective presents a vision of an enabling environment where human wellbeing is fundamentally connected to food production and where this cannot be left to uneven forms of market allocation, dictated by wealth, opportunism or profitability, but rather by a coherent agenda for social emancipation that recognise its constitution within ecological relations.

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