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City Region Food Systems



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The cover image is an interpretation of the city region food system by landscape architect Jacques Abelman, developed from his research on the city of Porto Alegre in southern Brazil.



Editorial: Food on the urban agenda

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Illustration by Corentin Perrichot

Food is increasingly an urban issue. This is gaining broad recognition among local, regional and national governments, international and support organisations, civil society, the private sector, consumers and academia. Evidence for this recognition can be found in cities in all regions of the world, where policy and programme initiatives are being undertaken in various fields related to urban and periurban food production and supply – as many of the articles in this Magazine illustrate.

“Our ambition is not to grow to become the largest company, but to change the food supply chain. It is important that, everywhere in the world, we reduce our dependency on the global food supply chain and once again feel the connection with our food” (Willem&Drees – see article on [page 51](#)).

This recognition is also illustrated by international initiatives and declarations such as the [Milan Urban Food Policy Pact](#). In this initiative, the City of Milan is engaged in a process of bringing more than 40 cities together to draft an Urban Food Policy Pact that aims to build awareness of urban food systems, policies and practices and also to harness political engagement by cities in order to ensure future

activities on related issues. The Urban Food Policy Pact will be announced at the Milan Expo in October 2015 (see also [page 24](#)).

Recent international declarations such as the March 2014 [Call for Action](#) and the April 2015 [Seoul Declaration](#), signed by 96 mayors, call on cities and other stakeholders to “encourage sustainable urban food production projects and resilient city region food system programmes”. Other international viewpoints are given in the articles in this Magazine by [3Keel \(page 5\)](#), [Hussein et al. \(page 8\)](#) and [Mendle \(page 12\)](#). The 2007-2008 food price crisis, the economic crisis in Europe, and climate-induced disruptions to food supply have all contributed to such a call for more resilient urban food systems. In addition, an alarming increase in diet-related health problems (like obesity and diseases related to food quality) in many cities around the world have made it very evident that cities need to think about how to ensure access to sufficient, affordable, healthy and safe food for their populations.

Cities – as hubs of consumption – also increasingly recognise their responsibility in building more sustainable food systems that not only reduce food waste and provide decent livelihood opportunities for those producing, processing and selling food (in rural, periurban and urban areas), but also promote environmentally sustainable forms of food production.

Furthermore, cities are starting to see food as a driver for other sustainable urbanisation policies. Food is directly related to other urban domains, including transport (a large part of city transport is related to food supply and consump-

tion); health (malnutrition, obesity, school feeding); land-use planning for agricultural and multifunctional areas; community development and revitalisation; employment generation (in food production, processing and retail); waste management (productive use of waste water and management of food waste); and climate-change adaptation and disaster risk reduction (for example, where localised food production reduces vulnerability to climate-induced disruptions in food supply).

Finally, food systems are recently being considered key in operationalising, among other things, the integration of rural-urban linkages, planning and climate-change adaptation at the territorial level (see also the [UN Habitat issue paper on rural-urban linkages](#)). In this context the notion of the city region, encompassing one or more urban centres and their surrounding periurban and rural hinterlands, becomes the relevant level of scale for the development and implementation of an integrated and comprehensive solution for a future-proof urban food system.

New York City's food strategy entitled "[FoodWorks: A vision to improve NYC's food system](#)" is a perfect example of a City Council's understanding of these responsibilities and relationships: *"Although many of these problems are national and global in nature, there are immediate steps that can be taken within New York City to strengthen our food system. The city can facilitate urban-rural linkages, support a market for regional products, and use its institutional purchasing power to support small and local producers. Moreover, by helping green the city's landscape, assisting companies with adopting new technologies, and exploring better distribution networks, we can begin to address the high energy usage and greenhouse gas emissions characteristic of our food system"*.

Development of resilient cities and city region food systems requires both political will and the use of available policy and planning instruments: infrastructure and logistics, public procurement, licences, and land-use planning – as illustrated by the articles on Zurich ([page 30](#)) and Ghent ([page 32](#)). It also requires that city regions assess their own, context-specific, food dependencies and vulnerabilities, opportunities, and roles to be played by various food system stakeholders – and any potential pressure points. Where possible, each city region should then develop a variety of strategies by which to improve its food system. This Magazine includes a number of articles (see [page 18](#) and further) describing a variety of food system research and design priorities, tools and methods. A research project recently started by RUAF Foundation, UN FAO and the Laurier Centre for Sustainable Food Systems aims to further develop and test a method for food system assessment and mapping in seven cities around the world.

Results of an on-going EC project called SUPURBFOOD: [Towards sustainable modes of urban and peri-urban food provisioning](#) highlight other guiding principles for designing and developing resilient city region food systems (Wiskerke, forthcoming 2015). These include the need to reconnect different urban flows to allow the reduction, recycling and reuse of food waste, urban organic waste and

wastewater, energy and nutrients. Articles on Rotterdam ([page 14](#)), France ([page 21](#)) and Vigo ([page 54](#)) illustrate practices and policies that cities are putting in place to address these issues.

Another guiding principle is to create and enhance spatial synergies by achieving multiple benefits by using land for more than one purpose at a time, and by using food as a medium to link different urban policy objectives. Examples include the promotion of synergies for food production, flood risk reduction, storm water management and climate-change mitigation – as illustrated in the article on Rosario ([page 48](#)); promotion of multifunctional agriculture for education, food production and leisure in Rotterdam ([page 14](#)) and Zurich ([page 30](#)); or the promotion of integrated spaces and neighbourhoods as in Riga ([page 60](#)).

A final key principle is improved food governance and transparency in the food system. This can be brought about by strengthening direct-producer linkages through short food supply chains – see the articles on Willem&Drees ([page 51](#)), Rome ([page 57](#)) and Ecuador ([page 68](#)). Food governance can also be improved by setting up and strengthening new organisational and multi-stakeholder structures that facilitate involvement of different government departments and jurisdictions (local and provincial), of various stakeholders and those that link civil society activities and initiatives to more formal food policy and planning (see the articles on Bristol, [page 26](#), and La Paz, [page 70](#)).

Cities will always be dependent on hybrid food systems; they will continue to source some food, for example, from distant locations and global food chains as well as from nearby rural, periurban and urban producers. Sole dependence on global food supply and systems, however, has increased vulnerabilities and risk as mentioned above. This Magazine gives recognition to incipient, innovative and longer-standing experiences in the field of city region food system development. We hope that this publication also becomes a tool for increasing local government and stakeholder prominence in national and international dialogue on sustainable urbanisation and food systems.

Upcoming issues of RUAF Urban Agriculture Magazine, on urban-rural linkages (in collaboration with ILEIA) and on integrating food and urban agriculture into urban policies and planning (in collaboration with the University of Buffalo) will share further experiences and cases to enrich this debate.

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Food in an Urbanised World: The role of city region food systems

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Julian Cottee
Tom Curtis
Simon Miller

Kampala, Uganda. Photo by Pal Teravagimov/shutterstock.com

Sustainable urbanisation and the food system

The challenge of food security is often framed as being one of feeding the growing human population of the world, but it is much more than just an issue of scale: the nature of the challenge is changing as well. The population has not just been increasing; it has shifted in character from being predominantly rural to becoming urban. In the latter half of the 20th century the world's urban population tripled in size and, for the first time in human history, more people now live in urban areas than in rural ones. It is expected that, by 2050, two thirds of the world's population will be living in urban areas.

Urbanisation has brought with it tremendous shifts in economic activity. It is also one of the predominant forces shaping food systems. These systems are becoming more globalised, with increasingly centralised networks involving fewer individual actors and supplying an increasing proportion of meat, dairy products and processed food.

In many countries, and for many people, the availability and choice of food is greater than ever before, and significant progress has been made on reducing hunger worldwide. Yet one in nine people still suffers from chronic undernourishment, half a billion people are obese, and one third of all food produced is lost or wasted. In addition, the ecosystem services upon which our food systems depend are being degraded, not least by the way we produce food now, undermining our ability to feed ourselves in the future.

Recognising that urbanisation increasingly shapes the challenge to food security suggests that the challenge is not a single global issue, but is instead an outcome of the myriad food supply chains that take food from (mostly) rural areas

to (mostly) urban ones. The challenges that are often framed as global issues are also bound to specific places, both in causes and impacts, and in our ability to effect change.

Linking cities and regions

Underlying the challenges of food security and a more sustainable, equitable food system is a profound disjunction between rural and urban development pathways, even though urban and rural areas remain linked by numerous ecological, social and economic processes. For example, rural areas provide food, water, energy, raw materials and labour to urban areas both local and further afield. Meanwhile, the concentration of people, capital and power in urban centres means that decisions and actions taken there affect rural people and places. Arguably, however, this interdependence has expressed itself in an ongoing reorganisation of rural spaces to serve the requirements of urban food consumption, at the expense of equitable and sustainable development – ultimately to the disbenefit of urban as much as rural communities.

At its root, the concept of city region food systems is about making the linkages between urban centres and their surrounding rural areas more effective at delivering sustainable socio-economic returns and a range of critical public goods. The rural-urban linkages that need attention span three dimensions: ecological, socio-economic, and governance linkages. In practice this might involve, for example, land-use planning that fosters more effective provision of ecosystem services, promoting shorter food supply chains, encouraging regional food enterprises, and creating participatory governance structures that include stakeholders

from multiple sectors and from both urban and rural areas. It is not a case of unquestioning localism. Rather, it is about creating a framework for conscious food governance that fosters improved balance between global and local food supply by taking local circumstances into account. It recognises the central role of the private sector in the food system, but is based on the understanding that public goods will not be delivered by market forces alone. Greater democratic participation in the food system and in decisions about food holds the possibility of profound socio-economic benefits across both urban and rural spaces.

The benefits of city region food systems

Though the city region food system concept is already gaining traction as a framework for action, it is also a relatively young idea. Many and varied claims have been made for the beneficial impacts of adopting policies structured around city region food systems, including benefits to food security, economic development, environment, health and governance. A categorisation and evaluation of evidence for these benefits is needed in order to help focus attention on those that are most likely to be delivered with significant impact, and to help guide future policy and research. For example, each potential benefit can be evaluated by analysing the feasibility of the proposed mechanisms, the potential scale and scope of impact, and the strength of relevant empirical evidence.

A preliminary evaluation suggests that seeking to improve the effectiveness of city region food systems would indeed carry potential for broad and inclusive benefits, especially concerning regional economic development, health, and

better governance. We also find some evidence for benefits in other categories, including environment and food security, but note that substantial further research would be needed in order to base the policy and practice of city region food systems on categorical evidence.

Making city region food systems a reality

Realising the potential benefits of city region food systems means changing the way that food systems operate as well as changing modes of thinking and action to create more harmonious links between rural and urban areas. The challenges of improving connectivity of this type should not be underestimated, but nonetheless there are promising examples of initiatives and programmes that have done just that. These include:

- putting in place more integrated and inclusive governance frameworks;
- planning for long-term value, including the provision of appropriate infrastructure and spatial planning;
- stimulating the demand for sustainable regional food through public procurement policy;
- leveraging enterprise, innovation and business as a way of delivering the benefits of city region food systems; and
- increasing the availability and transparency of information, including the use of information communications technology.

Reviewing a range of initiatives that already exist reveals that many have been driven or supported by public institutions (often working in alliance across jurisdictions). Depending on the initiative, civil society, entrepreneurs, farmers and businesses are also frequently involved. Scaling

Tha Kee Lek City, Myanmar. Photo by ArtThailand/shutterstock.com



up such approaches will require more multi-stakeholder alliances of this nature – participatory approaches are of key importance in reducing the risk of conflict around complex and sometimes politically sensitive local issues.

Conclusions and recommendations

The range of negative impacts from current food systems is symptomatic of a wider imbalance between urban and rural development. Improving the effectiveness of city region food systems offers the potential to shift towards a more harmonious and equitable development trajectory, based on participatory governance that involves a range of city region stakeholders.

There is now an opportunity for change, with the confluence of an emerging body of thought and practice regarding city region food systems; the increasing commitment to end hunger; and the culmination of several international processes that will have a significant bearing on food systems and the future of urbanisation. Of most relevance in this regard are the finalisation of the Sustainable Development Goals, to be agreed at the United Nations General Assembly in September 2015; a climate agreement to be delivered at COP 21 in Paris in December 2015; and, the Habitat III meeting, to take place in 2016. The next two years therefore offer a distinct window of opportunity to demonstrate the relevance and importance of city region food systems to a more balanced and integrated approach to rural and urban development.

Based on practical initiatives, ten actions are outlined that could help to strengthen city region food systems linkages in policy and practice:

Catalysing Change

1. Recognising the ability to act: City and rural authorities should explicitly recognise the links between food systems and a wide set of public goods (including access to healthy and nutritious food), and recognise the opportunity to facilitate positive change.
2. Convening stakeholders: Local authorities and civil society organisations can play a pivotal role in bringing together wide coalitions of interest, creating the basis for stakeholder engagement and support in future food policies and programmes.

Understanding the food system

3. Understanding local food systems: City region food policies need to be based on good understanding of the local context, including where food comes from ('foodprinting') and what the outcomes of the food system are for both urban and rural populations. Civil society, local authorities and the research community have a role in defining appropriate metrics, analysing data and making information publicly accessible.

Using policy instruments

4. City region policy: Policy and research communities, and development agencies, should actively support local authorities in the development of city region food policies, including land use and planning frameworks that enable multi-sector, territorial approaches.



Hanoi, Vietnam. Photo by Wyshe/istockphoto.com

5. Infrastructure and support: Local authorities and development agencies will need to invest in infrastructure such as market places and rural roads, conserve farm land under their purview, and invest in market information services that support city region value chains.
6. Procurement: City and rural authorities can catalyse city region food system value chains through public procurement policies: e.g. through incentives for meals for schools, prisons and hospitals to be sourced from local producers.
7. Enabling policy: National governments, international institutions and donor organisations should ensure their policies facilitate better city region food system governance; an early step would be to address existing policy barriers.

Leveraging wider impact

8. Enterprise and innovation: Local authorities and development agencies should create incentives for and support the development of new enterprises that link consumers and producers. Existing enterprises should invest in social and technical innovations to facilitate these connections.
9. Financing: Development agencies, governments and the investment and philanthropic communities should support initiatives that can strengthen city region food systems. Consideration should be given to financing mechanisms such as municipal bonds and social investment vehicles.

Learning and sharing knowledge

10. Spreading best practice: All actors should ensure that outcomes of initiatives to promote more sustainable city region food systems are recorded and evaluated. NGOs, national institutions and universities can play a role in facilitating the sharing of policy and practice between city regions nationally and internationally.

Steve Jennings, Julian Cottee, Tom Curtis and Simon Miller

Note

* This article is a summary of a draft consultation document titled "Food in an Urbanised World: The role of city region food systems in resilience and sustainable development" elaborated by 3 Keel and commissioned by the Prince of Wales's International Sustainability Unit. The full report is available here: <http://www.fao.org/fileadmin/templates/agphome/documents/horticulture/crfs/foodurbanized.pdf>



City Region Food Systems: An inclusive and integrated approach to improving food systems and urban-rural linkages

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Food market. Photo by Arnaud Thierry Gouegnon

Urbanisation affects not only the structure of the agricultural sector and food systems, but also the larger non-farm economy. Recognising the diversity of urbanisation processes and rural linkage dependencies is essential, and a city region food systems approach can help better understand and link sustainable urbanisation and sustainable food systems across different contexts.

Recognising urban-rural dependencies

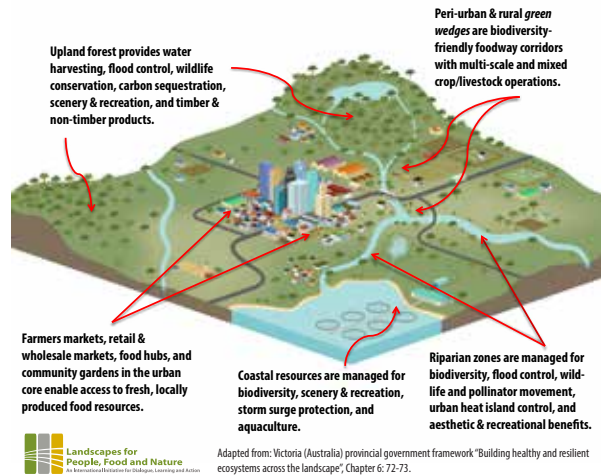
As populations gravitate around urban centres, whether megacities or small and medium-sized towns, there are now and will continue to be increased difficulties in meeting the needs and realising the rights of growing urban and rural-based populations. This includes the availability of adequate housing, transport, health and sanitation, education, ecosystem services and social protection. Another core challenge is to ensure adequate access in urban areas to food that is: healthy, meeting nutritional needs and free of harmful chemicals; accessible, in both price and availability; and sustainable, working with nature and through sustainable practices. Access to food is critical for those who buy more food from the market than they grow or sell (most of the poor in both urban and rural areas), and urban-rural linkages are a vital component to ensuring such access.

Opportunities are also created by urban development. Urban centres of different sizes have key roles in stimulating rural development through access to markets and services. However, the connectivity of urban centres to their rural hinterlands is often weak. Integrated territorial approaches can help development policies at the national and local levels to better take into account urban-rural interdependencies.

Regional and sub-regional differences shape the degree to which poor and marginalised rural people living around urban centres and in their hinterlands can take advantage of urban linkages and markets. A systems perspective is therefore vital to analysing and understanding the linkages from smallholder production, agricultural value chains and consumer demand – whether that be in urban or rural areas. In this context, a city region food system (CRFS) approach creates a critical lens for analysis, while at the same time supporting on-the-ground policy transformation and implementation. Urban and rural areas are often treated as separate sectors at a national and local level, and within different agencies on the international level. This distinction, however, does not reflect realities on the ground where flows between rural and urban areas are constant and are changing rapidly. Nor will this false dichotomy enable the needs of sustainable urbanisation and rural transformation to be met.

Example: Quinoa in Bolivia linking farmers to urban markets

In Bolivia, the world's largest grower and exporter, quinoa (an Andean grain) has been seen as a "poor person's food" and most Bolivians have favoured less nutritious, imported grains. Now a campaign to promote quinoa consumption in Bolivia is improving not only diets, but also the livelihoods of small farmers. Through collaboration with restaurants in Bolivia, where a cake made of quinoa is sold in a popular coffee shop in La Paz, the income of smallholder farmers is improved and biodiversity conserved. (Source: IFAD. For further information, see video here: <https://www.youtube.com/watch?v=z4oZtVmWgOw&feature=youtu.be>)



Source: <http://peoplefoodandnature.org/publication/city-regions-as-landscapes-for-people-food-and-nature/>

Fortunately, in debates concerning sustainable urbanisation in the context of a new post-2015 global development agenda, the rural-urban nexus has become a major theme. Additionally, there is now clear recognition of the need to target integrated urban, periurban and rural planning for sustainable development, including food and nutrition. This is reflected, for example, in the proposed Sustainable Development Goal 11, "Make cities and human settlements inclusive, safe, resilient and sustainable", slated for approval by UN members at the autumn 2015 General Assembly meetings. Section 11b refers explicitly to the need to support positive economic, social and environmental links between urban, periurban and rural areas by strengthening national and regional development planning¹.

Why city region food systems are important

Food systems are one way in which rural spaces and people are linked with urban areas and residents. Dynamic urban food systems and changing demand for food products – locally and internationally sourced, unprocessed and processed products – are driving transformations in food production and trade, with major implications for smallholders, rural and periurban producers, and key opportunities to improve the lives of marginalised populations.

City region food systems encompass 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 periurban and rural hinterland; a regional landscape across which flows of people, goods and ecosystem services are managed."²

In this concept of city region food systems, we include not only major cities and urban agglomerations, but also the small and medium-sized towns that provide critical links between people in rural areas and urban services, markets and employment opportunities.

Improved city region food systems will help balance the urban with the rural to improve economic, social and environmental conditions. Access to affordable, nutritious, and fairly traded foods from local and regional producers will be more easily available to all communities, from rich to poor, and from rural to urban. Access to markets and support to alternative markets (e.g., community supported agriculture, farmers' markets, cooperatives, fair trade) will be available to smallholders and other small-scale producers, not just to big players. Shorter value chains, and more broadly efficient and functioning agricultural value chains that link hinterland producers to market systems, can contribute to sustainable diets and stabilise livelihoods in the distribution, processing and manufacture of food and fibre products.

Dynamic and accessible local and regional market systems are major drivers for social and economic development in both rural and urban areas. In the USA, where small- and medium-scale farmers have until recently been shut out of many wholesale markets, there is a movement to create a new generation of wholesale "regional food hubs" linking rural and periurban farmers to urban markets. For example, in the New York city region there is a coordinated planning effort to reinvest in food system infrastructure serving new institutional and wholesale demand for local foods, with new food hubs in both rural and urban areas.

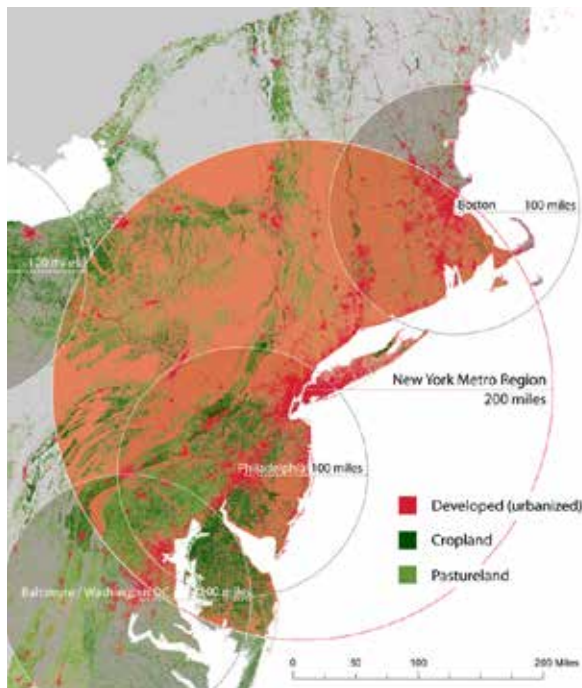
In addition to benefits related to food, city regions can also benefit from improved ecosystem services provisioning clean water, nutrient and waste flows, and other natural resource, energy and labour flows. Scarce water, nutrients and energy, for example, can be resourced, reused and recovered from urban waste flows in a periurban setting.

When these services are well integrated by government, local private sector and civil society actions to serve economic, social and environmental values simultaneously, then a healthy symbiosis of towns and the rural areas around them may be concretely realised.

The city region food systems lens also offers an opportunity to implement equal access and rights-based approaches to development, as the current global food system does not adequately sustain or support the diverse range of all actors and their needs.

Urban food demand can stimulate the development of food systems and local economies that improve access to adequate food and nutrition for commonly marginalised populations. As well, urban food demand can stimulate the emergence of new markets related to evolving consumption patterns (e.g., fresh fruit and vegetables, meat and dairy). This is one way of moving towards realisation of the right to food for both urban and rural dwellers at the local level.

Developing well-functioning and efficient food chains between urban areas, whether small and medium-sized towns or cities, and between urban consumers and producers based either near them or in the urban hinterland, promises many benefits. These include increased availability of fresh locally produced fruit, vegetables and grains, and decreased food losses and waste, and also decreasing environmental impacts caused by long-haul transport.



Source: Urban Design Lab: http://www.urbandesignlab.columbia.edu/?pid=nyc_foodshed

Strengthening local food systems can also help mitigate the effects of price volatility and shocks in international markets while also providing more accessible markets for the agricultural products of regional food producers. There is some evidence from the early years of the food price crisis, 2007–2008, that regions with diverse local and regional food systems were better able to buffer the volatility of global food prices. Enabling policy environments for city region food systems (for example, through procurement, marketing and migration policies) can target better access to affordable, safe and locally produced food for low-income urban populations (not only middle- and upper-class residents) while further strengthening small-scale food producers.

These enabling environments may start with the development of food councils or strong executive (e.g., mayoral) leadership, or as a response to health or environmental pressures.

However, there are constraints that undermine the capacity to take full advantage of new opportunities in city region food systems. These include small-sale producers' poor and insecure access to, or control over, productive assets, financial services, knowledge and technology, and in some cases a lack of access to reliable energy, transport and infrastructure. Addressing such constraints partly depends on strengthening rural-urban connectivity via infrastructure, input and output markets, financial and technical advisory services, access to information and ICT. Access to these services, and in particular land, natural resources, seeds, and fair markets for small-scale producers can also be addressed by policy. Access is a critical component with regard to improving living and working conditions for these populations and at the same time streamlining and operationalising human rights obligations.

Diversity of city region food systems and challenges

A city region food system approach recognises that there is great diversity regarding the context, nature of urbanisation (or in some cases a return to rural areas), size of urban centre, type of food systems, cultural values and traditions, and history of relations with the surrounding countryside and rural populations. For example, in those parts of Africa and Asia where urbanisation is expected to grow most rapidly, and where urban settlements will expand into areas that have previously been predominantly rural, competing with land used for agriculture, the challenges are dramatically different than those faced in cities of the global north and their need to retrofit human settlements to integrate urban and rural areas.

Detroit, Michigan in the United States may be among the most well know “retrofit” cities in the global north. Detroit is an industrial city in North America that suffered economic collapse and population loss but is rebuilding its urban infrastructure with a deliberate inclusion of urban and peri-urban food production. Land access and tenure, and access to neighbourhood, school food and other institutional food markets are among the challenges addressed with the help of a Detroit Food Policy Council founded in 2009 (<http://detroitfoodpolicycouncil.net>).

Barcelona, Spain is a striking example. This European city reinvested in a year-round market infrastructure that places markets within a short walk for all city residents while bringing the products of the Catalonia region to urban markets. This investment in markets is justified on the basis of not only economic value, but also social, cultural, resilience and health values.

Rosario, Argentina is one the cities trying to better link peri-urban and rural production with urban consumers. It is preserving traditional agricultural production areas in the

areas surrounding the city and zoning them as protected land for primary production.

Whether expanding or retrofitting, addressing a city region food system necessarily includes the improvement of natural resource management and governance of farming systems so that they become more environmentally sustainable, resilient to climate change, and respectful of international rights obligations and frameworks. There is no 'one size fits all' approach to addressing challenges and opportunities related to city region food systems. Appropriate responses are likely to be more successful when better informed by evidence and knowledge gathered from different contexts and actors, and with full participation at the local level.

Meaningful multi-stakeholder approaches are essential

The key actors involved in city region food systems are different in each context and often have competing interests. These interests need to be taken into account and addressed equitably in policy and decision processes in order to achieve city region food system development that can benefit all and support local economic and social development. This development includes involvement, from poor small-scale producers and family farmers, traders and processors on through to urban consumers requiring fresh, nutritious and affordable foods. Ideally, a city region food system agenda will also require collaboration between all levels of government (national, regional and local), nongovernmental and community-based organisations, farmers' organisations, the (local) private sector, the research and philanthropic communities and international support to scale up innovation.

However, local level food system development is usually achieved through individual, joint and collective initiatives, with small-scale food producers at the core, and in processes that are often delinked from the formal market and institutions. There is a need for greater understanding of how current local/regional food systems have formed and are functioning, and how policy at all levels can provide greater support to promote positive, local practices. These needs will become more apparent with direct involvement of local communities, with particular attention to small-scale producers and agricultural and food workers, in dialogue and policy decision-making. Best practices include multi-stakeholder food planning/policy councils, which many cities, including Toronto and Belo Horizonte, have successfully implemented.

Looking forward

City region food system approaches can help inform the implementation of a linked transformative agenda for both sustainable food systems (stimulating smallholder agriculture, sustainable rural and urban production, employment, livelihood support, and food security) and sustainable urbanisation. Creating such linkages will be essential to a broad-based, equitable and sustainable development process.

In the next few years there will be opportunities to continue to elevate the compelling argument for territorially inclusive approaches to governance and food systems. These opportunities include, but are not limited to, the refinement of the post-2015 development agenda in 2016, and the Habitat III Conference to be held in Quito, Ecuador, in October 2016. The post-2015 development agenda could include refined targets and indicators that focus attention on reducing rural-urban inequalities, balancing investments in rural and urban spaces and employment, promoting better connectivity and taking advantage of urbanisation to spur rural transformation. Stakeholder engagement with the above-mentioned and other policy processes can be undertaken in coordination with national delegations, UN agencies, civil society networks, the research community, donors and the private sector.

A *city region food system knowledge platform*, which is currently being developed in the context of a multi-stakeholder collaborative partnership (see www.cityregionfood-systems.org) will also be very useful for sharing information, knowledge, approaches and concrete, on-the-ground experience in emerging city region food systems around the world. It will provide a way to share evidence on the key trends and drivers of the linkages between rural and urban areas, people, their organisations and enterprises in relation to food systems, from production through to consumption, and on the diverse nature of city region food systems in distinct contexts.

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Notes

- 1 See: <https://sustainabledevelopment.un.org/content/documents/1579SDGs%20Proposal.pdf>
- 2 Definition agreed during a meeting amongst CRFS partners in Rome, December 2013



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Roman Serdar Mendle

Food Systems on the City Agenda

Mayors of ICLEI member cities commit to adaptation and sustainable city region food systems by signing the 2013 Declaration of Mayors in Bonn. Photo by ICLEI - Local Governments for Sustainability e.V.

Cities realise the importance of sustainable food systems

Enter “Urban Agriculture” into your browser search bar. You will find an ever-growing number of articles and videos from all parts of the world, with inspirational stories and cases of local action to sustainably feed the ever-growing number of urban dwellers worldwide. You will also realise that producing food in cities is no longer a niche idea – if it ever has been – but rather one that has already caught on with local government leaders. “Good food is at the heart of a healthy lifestyle and should be available to everyone, irrespective of where they live or how much they earn. We want to make good, affordable, local food an absolute reality for many of Bristol’s most disadvantaged areas, especially for those currently fighting food poverty”, says George Ferguson, the mayor of the European Green Capital 2015, Bristol.

In the complex global food system that we rely on for our daily bread, cities have been consumption centres, sinks for resources from not only their hinterland, but all across the globe. Climate change, desertification, imbalances in local and global nutrient cycles as well as poverty and economic dependencies are at once drivers and results of what many see as flawed global food systems. These in turn create nutrient and resource waste, increasing problems of malnutrition and obesity, and a great need for action and change. For many, the most leverage in solving the mammoth task of reforming the global food system comes from local solu-

tions. Local or “city region” food systems are more manageable in size and complexity and can contribute to increased food security and resilience by diversifying the variety of food sources and by reducing dependency on international markets. Linking food to other urban issues actually provides synergetic opportunities for ecosystem services and biodiversity, enhanced resource recycling and improved energy efficiency. City region food systems can even bring gains in social and economic sustainability, offering new opportunities for local and regional employment for producers and other actors in the food chain. The possibilities are vast.

Cities across the globe commit to action

Cities are increasingly aware of the issues and opportunities; some are already eager to act on them. In early June 2013, city leaders from Seoul to Nantes and Vancouver to Dar es Salaam got together in Bonn, Germany to sign the 2013 Bonn Declaration of Mayors. The twenty signatories committed to “holistic ecosystems-based approaches for city-region food systems that ensure food security, contribute to urban poverty eradication, protect and enhance local level biodiversity and that are integrated in development plans that strengthen urban resilience and adaptation”.

There is an ever-growing number of city initiatives that demonstrate the will and ability to translate intention into action. The Climate Field School in Dumangas, a city in the Philippines, arms farmers in the immediate vicinity of the



Multicultural urban farming in Ghent. Photo by Wannes DeSite

city with the skills and knowledge they need to read weather forecasts, interpret satellite photos and set up their own weather stations. This improves livelihoods and integrates the city of Dumangas with its rural surroundings in a more resilient city region food system. In another example, Kesbewa in Sri Lanka uses ecological and climate-smart production technologies to rehabilitate paddy fields in flood zones and wetlands while also supporting home-garden units within the city to increase the overall self-reliance of the city region food system.

These examples are just the tip of the iceberg. Some cities address local food procurement (Belo Horizonte, Brasil; Malmö, Sweden), promote urban and periurban agriculture and community gardening (Windhoek, Namibia; Toronto, Canada), reduce food waste (Bristol, UK), launch healthy nutrition and school feeding programmes (London, UK and Accra, Ghana) or improve waste recycling and reuse (Milan, Italy and Lima, Peru) – and the list does not end here.

Cities are already taking their first steps to making their local food systems more sustainable. The next steps are enhancing policy support and uptake to up-scale and sustain these actions, as well as spreading experience, solutions and ideas among cities, their leaders and experienced stakeholders across the globe.

Custom solutions for specific local needs

Done right and on a large enough scale, food production in and around cities offers much potential to better utilise urban space and drive down food-related energy consumption while opening up new possibilities for water and nutrition recycling as well as renewable energy production. Parwinder Grewal, researcher and lecturer at the University of Tennessee and Fullbright Scholar at the Stockholm Resilience Centre, demonstrated in a presentation at the Urban Agriculture Strategy Meeting held at the ICLEI Resilient Cities Conference in Bonn 2014 that the city of Cleveland could reach near self-sufficiency in poultry, egg, vegetable and honey production if it were to utilise all available private and commercially owned urban spaces – from

CityFood Network launched at ICLEI World Congress 2015

To support and network among interested cities, ICLEI launched its community on Urban Agriculture and Resilient Food Systems (CityFood network) at its World Congress in Korea in April 2015. This network, which is jointly facilitated with the RUAF Foundation, promotes learning among cities, makes available tools and guidelines, and connects advanced local and regional governments with those that are in the early stage of their activities. CityFood will work closely with partner organisations to provide a wide range of continuous technical support and policy advice opportunities. For more information: cityfood@iclei.org.

lawns to rooftops. Vertical farming solutions, from automated small-scale plant growing units for restaurants and homes to industrial-scale vertical farms, are under development by companies like Infarm, Plantagon, Agrilution and others. Such approaches may provide the option to produce food even in very densely populated areas, where space is one of the most valuable urban resources (see for more case studies UA Magazine No. 28, Innovations in Urban Agriculture).

With solutions for urban food production ranging from low-tech to high-tech, with projects running from small scale to large scale, and with other tools such as local procurement, agricultural land use zoning and waste management, cities have a wide and growing arsenal of measures available to redefine local city region food systems, making them more self-sufficient, resource efficient and socially sustainable. Tapping into this potential requires just as much sharing of reflected knowledge on business models and policy frameworks as it does the sharing and dissemination of technologies. Not every solution is suitable for every city's specific local circumstances, and the right mix of actions and policies has to be carefully designed and redefined for each specific city region food system. Looking at the city through a systems lens, it becomes clear that food is indeed an issue at the centre of urban sustainability.

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Developing the Rotterdam City Region Food System: Acting and thinking at the same time

Jan Willem van der Schans

Herb gardeners. Photo by Rotterdamse Munt

The city region of Rotterdam is located in the western part of the Netherlands, bordering the North Sea. It contains the municipality of Rotterdam and several neighbouring municipalities, with about 1.2 million inhabitants. Rotterdam hosts Europe's largest sea port as well as a large (inland-oriented) river port. Shipped through the ports into Europe (by barge, rail or lorry) are goods including food (e.g., exotic fruits and vegetables, juices, rapeseed and palm oil) and feed products (soybeans, grains, tapioca).

The cheap import of feed ingredients into the EC through Rotterdam enabled the development of an intensive livestock industry (pigs and poultry) in the more rural parts of the Netherlands. The port area hosts a large industrial area (petrochemicals, etc.). Port-related food and feed processing (margarines, mayonnaise, peanut butter, beverages, flour milling, animal feed, etc.) is also located in the city region. Although the region is highly urbanised, close to Rotterdam we still find a variety of agricultural production areas, including arable crops (Midden IJsselmonde, Hoekse Waard), dairy (Midden Delfland, Groene Hart) and also Europe's largest

complex of greenhouse horticulture production (Westland and Oostland).

Policy development

Given the international orientation of the Rotterdam city region, one may wonder where the city's interest in short food supply chains and regional food systems comes from. This section contains an explanation of the background and current outlook. In 2007, a Ministry of Agriculture innovation programme commissioned a small project for which a communications bureau in Rotterdam was to organise a brainstorm meeting on new relations between cities and agriculture. A variety of parties was invited, and by the end of the meeting it became clear that the city of Rotterdam did not know what to do with the discussion results. Some people decided to meet more often, and so they did, creating Eetbaar Rotterdam (Edible Rotterdam: ER), a self-proclaimed expert group on urban farming, that proactively started to organise events and presentations in order to put urban agriculture on the agenda. ER members included the communications bureau, some architects, a farm advisor, a researcher and, in a later stage, the owner of a restaurant serving local food. The municipality declared 2008 as the "Green Year" to highlight the importance of urban green infrastructure. The Rotterdam planning department reviewed its public green space policies and found that relatively few city dwellers use the large-scale recreation areas

around the city, while the green spaces within the city were evaluated as being too uniformly designed and too poorly maintained. At the final conference it was concluded that urban agriculture could provide an interesting perspective to solve these issues.

A think tank called Urban Farming (which in Rotterdam includes periurban farming) was set up to act as a platform for civil servants of various departments to facilitate urban farming initiatives and discuss policy alternatives. One of its activities was to organise network meetings to bring together urban farming initiatives; another was to formulate policy goals in interaction with the relevant executive councillors, especially the councillor responsible for public green space management. Keeping in mind its limited budgetary resources – but also recognising the power of food to help solve urban issues (such as obesity) – the municipal government did not develop an explicit food strategy, but rather tried to encourage bottom-up community initiatives and entrepreneurial initiatives. A five-point action plan was developed to (1) increase the visibility / accessibility of food growing in and around the city, (2) organise the short food supply chain (logistics, farmers' markets), (3) account for local food in public procurement, (4) improve the long-term economic perspective of periurban farmers, and (5) stimulate edible green roofs in the city centre. In 2012, a policy document was approved. Its focus was three priorities for urban agriculture: public health (healthy diets for Rotterdam citizens), economic viability (periurban and urban farmers as entrepreneurs) and spatial quality (urban agriculture to maintain green space in and around the city).

In 2013, the city established a Regional Food Council, a network organisation without a budget including stakeholders such as periurban and urban farmers, chefs, the owner of an organic supermarket, researchers, two mayors of neighbouring municipalities, educational institutes, the vegetable auction, and also a large multinational food company with several production facilities in the port area. Three focus themes were chosen: (a) short food supply chains, (b) education and (c) circular economy. In 2014, after local government elections, the coalition shifted towards a more conservative approach. Food is no longer such a social and/or ecological issue, but rather an economic one (fresh logistics, employment, education, etc.). The Food Cluster has been discovered to be the third most important cluster of economic activity in Rotterdam (after the port and the medical industry). The opening of the Markthal in 2014 (a covered market hall with more than 80 stalls) is an iconic architectural testimony to this new-found interest in food.

Urban agriculture in and around Rotterdam

While the Rotterdam food policy was being developed, several urban agriculture initiatives and also some other established initiatives started to see themselves through the lens of urban agriculture. One of the biggest urban agriculture initiatives in the Netherlands started in Rotterdam in 2012. *Uit Je Eigen Stad* (From Your Own Town) is a 2.3 hectare commercially operated farm at an abandoned rail yard in the port area (www.uitjeeigenstad.nl). It includes open field vegetable growing, hoop houses, a

greenhouse for indoor vegetable growing and fish farming (aquaponics), mushroom growing, chickens, a farm shop, a restaurant, and conference facilities. The farm was established with a loan from a social housing corporation as a strategy to claim a place in the transformation of the area from industrial port to residential housing. Part of the capital raised was crowdfunded. In 2014, in order to professionalise that rather important revenue-generating part of the operation, ownership of the farm was partially transferred to a restaurant owner.

Stadslandbouw Schiebroek (Urban Agriculture Schiebroek) is a network of urban gardens for residents in a social housing neighbourhood (<http://stadslandbouwschiebroek.blogspot.nl/>). The initiative is coordinated by a very experienced allotment gardener, and was commissioned by a social housing corporation in 2011 to improve the quality of life in the neighbourhood. Most of the gardens are situated in public green spaces. As the social housing corporation is withdrawing its financial support, participants increasingly also engage in catering, farmers' market sales, etc. Another initiative with social objectives is the Voedseltuin (Food Garden, www.voedseltuin.com), since 2011 also located in the Rotterdam port area. Here a group of volunteers work together with unemployed individuals who are invited to acquire basic skills towards reintegration into the labour market. They produce organically grown food for the nearby food bank. The garden is developing into a park-like space which fits into the transformation of the port area. New initiatives are also emerging: in 2014, Rotterdamse Munt (www.rotterdamsemunt.nl) started an open field herb garden in a deprived neighbourhood, inviting women from different ethnic backgrounds to participate in gardening. The herbs produced are sold to local restaurants and also served as fresh teas at the garden's beautiful terrace.

Short food supply chains

Short food supply chains are on the rise in Rotterdam. Since 2007 Rotterdam has hosted a farmers' market/local food festival (www.rotterdamseoogst.nl), originally held once a year but gradually increased to its present frequency of every other week. Willem en Drees (www.willemendrees.nl) is a grocery wholesaler specialising in local food that is also sold in Rotterdam – see also the article on [page 51](#). Another internet shop is Rechtstreex (www.rechtstreex.nl). They collect products from farmers in the region and distribute to pickup points in the neighbourhood where a district manager arranges for delivery to consumers. Rechtstreex is also one of the initiators of Fenix Food Factory (www.fenixfoodfactory.nl), a place where makers of artisanal food products are together transforming an abandoned warehouse in the redeveloped port area into an ultra-hip food market. After the Markthal (www.markthal.nl) opened, a number of new short food supply chain initiatives were established, including – though this went bankrupt within three months – a cooperative (Buutengewoen) of dairy and arable farmers as well as fishermen from the Goeree peninsula. Two cooperative initiatives from greenhouse growers and open field growers offering both vegetables and fruits also entered the Markthal: Natuurlijk! (<http://natuurlijkmarkthal.nl/>) and Vers van de Teler (www.versvandeteler.nl).

Closing urban loops

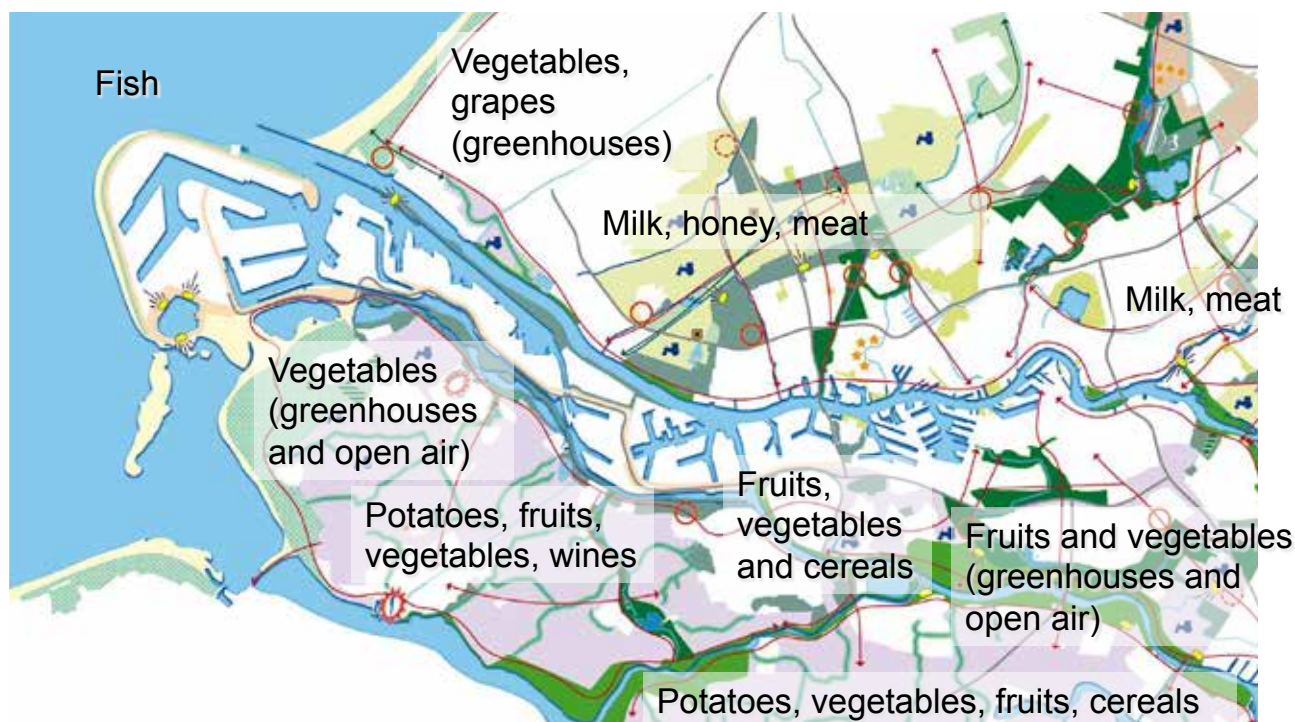
One aspect of urban farming is to prevent and reuse urban biogenic waste streams. One example of this type of initiative is HotspotHutspot (<http://hotspothutspot.nl/>), a chain of pop-up restaurants (the “hotspot”, a cool place to hang out after school) where children learn how to cook a meal from scratch using produce from container urban gardens and leftovers from an organic wholesale market. The restaurant (the “hutspot”, the name of a traditional Dutch stew) serves three-course healthy meals at the price of a Big Mac to a variety of target groups including people with low incomes. The restaurant now has four locations, mainly in deprived neighbourhoods of the city. Another example is RotterZwam (www.rotterzwam.nl) – see UAM 28), a business growing oyster mushrooms and shiitake on coffee waste in an abandoned indoor tropical waterpark, close to the centre of Rotterdam. The coffee waste (which would otherwise be incinerated) is collected from local cafes by cargo bike; after it has been used as a medium to grow mushrooms, enzymes can be harvested from the mycelium to be used, for example, in bioplastics. Also appearing in Rotterdam are communal composting initiatives, such as the “compost lane” at the Zuiderhof allotment garden complex in the south of the city. Here allotment gardeners collectively compost their own green waste, thus both reducing the cost of having it taken away by the city and avoiding the expense of buying compost to fertilise their allotment gardens (Cerrato 2014). The city is now trying to streamline community composting initiatives, and also piloting separate green waste collection in order to shift from incineration to composting. As well, on a large scale, CO₂ emitted from some industries in the Rotterdam port area is being purified and transported to the Westland greenhouse area, where it is used to enrich the air in order to stimulate crop growth (www.ocap.nl/). Finally, there are experiments on recovering the fresh water from urban

sludge, cleaning it, and reusing it to water the plants in the greenhouse area (www.delftbluewater.nl/).

Multifunctional use of the land

Another aspect of urban agriculture is its location in the urban landscape. Inside the city, most urban agriculture initiatives have temporary status; many hope that urban development will resume after the crisis, and land owners – including the city – are not (yet) willing to sacrifice building locations for urban food production. This temporary status for urban agriculture projects prevents large investments, both financial (bank loans or venture capital) and physical (soil improvement, infrastructure development) (EZ 2014). At the fringe of the city, however, a change in perspective does seem to be taking place, due on the one hand to the crisis and on the other hand to the fact that urban dwellers have come to value local food production. In 2013, Rotterdam changed the zoning designation of a large piece of land (480 hectares) bought from farmers north of the city: Polder Schieveen. In 2009 this polder was designated to become a business park, including new nature reserves. This plan, however, led to opposition; also, during the financial crisis it became clear that there was no need for more business parks in the region. The city changed the designation of the polder again to become an “urban agriculture zone”, a multifunctional agricultural production zone. Over the past couple of years, the land had been extensively used by farmers who were bought out awaiting further development. The new zoning included food production orientated to the city and due respect to the recreational and educational values of the peat meadow landscape as well as its biodiversity. The city invited parties to submit innovative proposals. One party that gained a place in the polder is a herdsman who herds his flocks of sheep on greens in and around Rotterdam (<http://maoosthoek.nl/>). The proposal is to build a winter stable for the sheep and a visitors’ centre with a shop, restaurant,

Regional products from Rotterdam. Illustration by: City of Rotterdam



education facilities, and so forth.

To the south of Rotterdam there is a large piece of arable farmland (600 hectares) designated to be transformed into a new nature reserve that includes recreation as well: het Buitenland van Rhoon (<http://www.buitenland.nl/>). Over the years, however, resistance to this transformation has built, from farmers and rural dwellers. These opposers have been increasingly successful in allying themselves with urban parties who either prefer the arable land to stay the same or advocate multifunctional land use, food production for the city of Rotterdam and also farm-based recreation, education, biodiversity, etc. This would mean a de facto urban-agriculture type of zoning (the term “urban agriculture” has been used and misused in the debate). In 2014, a court ruling vindicated the original transformation plan (to create new nature and recreation) but a citizens’ initiative supporting existing farmers was mobilised to bring the case to the attention of the national parliament. The struggle continues to this date. At the border of this contested area lies a social care farm (www.debuytenhof.nl) with apple and pear orchards, a market garden, a flower garden, a wood workshop, Hungarian wool pigs, beef cattle, a tea room where one can also have lunch, and a farm shop run by volunteers.

Conclusions

The city of Rotterdam is gradually building a “food policy”, step by step, acting and thinking at the same time. There was no grand plan from the municipal government, the city reacted to bottom-up initiatives that came into existence without much support from official policy. Gradually, urban agriculture was picked up in the policy discourse, but never with large budgets to support it. The city facilitates initiatives by helping with licenses, access to markets, etc. It should be noted that Rotterdam hosts a wide range of rather entrepreneurial examples of urban agriculture: Uit Je Eigen Stad, HotspotHutspot, RotterZwam, Rechtstreex, Buijtenhof, etc. This may be seen as a rather unique feature of the Rotterdam urban agriculture scene.

Food is, indeed, a theme that cuts across many domains. It includes aspects of social participation, physical public space maintenance, climate mitigation and adaptation, healthy diets, etc. It is therefore unclear where it belongs in the city administration, which budgets with which accountability criteria can be allocated to initiatives. Although urban agriculture entered the local policy debate through urban green space, this characterisation is too limited, as it also contributes to poverty alleviation, social health, quality of urban living, and more. The think tank Urban Farming and the Food Council are trying to create a “communicative space”, a place where diverse stakeholders can meet and discuss ambitions and aspirations informally, without regard for formal positions. Departmentalisation still exists, however. Cooperation between different branches of government and between different councillors remains difficult at times. There have been some moves recently to merge various departments (city planning, urban green space management and city development). Urban agriculture may benefit from this process, as it may be taken into account more integrally in urban economic and social development strategy.



Children learn how to cook a meal from scratch.

Photo by Hotspot Hutspot

For several years, urban agriculture initiatives were unofficially condoned. Once initiatives become professionalised, however, those responsible want them to be formally recognised in order to build a stable operation (land tenure, use conditions, etc.). Ironically, though, official recognition can also be counterproductive. When an initiative is not yet formally recognised, or when it is recognised as an “artistic” project, there is also no formal enforcement of rules and regulations (licenses, etc.). When an initiative is officially recognised it must also comply with all kinds of rules and regulations that may not be designed with urban agriculture in mind.

If the creation of short food supply chains, the closing of urban nutrient, energy and water streams, and the multifunctional properties of food production in the metropolitan landscape are simultaneously taken into account, an urban food system can be built that is more than just a collection of individual projects. If the connections are there, and if they are well maintained, the Rotterdam food system will be more sustainable and more resilient. The polder Schieveen landscape can be maintained so much more easily if it is connected through short food supply chains with urban markets (e.g., selling meat from the sheep to urban consumers). Urban agriculture initiatives such as Uitjeeigenstad or Rotterdams Munt can be maintained so much more easily if they can sell their produce under affordable conditions in the Markthal. If water, nutrients, and organic matter can be recovered from urban waste streams, and if they are returned to fertilise the urban farm land – only then can we maintain its productive capacity for generations to come.

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The Food Systems and Food Security Study for the City of Cape Town

Stanley Visser

Mr Jackson in the food garden in Joe Slovo settlement. Photo by Christopher Hewett

A long-term vision is needed for an improved food system in Cape Town with the short term objective of eradicating chronic food insecurity. To meet the challenges of improving nutrition and feeding a growing population in the face of rapid urbanisation, the council and city planners must make the metropolitan food supply system an integral part of their development and planning strategies. This must happen in the context of local government in South Africa, where there is currently no explicit mandate to address food security. Although many actors are working in some way on interventions in the food system, one could fairly question these interventions' significance and urgency (Visser 2011). The city council of Cape Town, under leadership of the Mayor, has taken a proactive approach by commissioning a study to inform the city's response to food security and food system planning.

Introduction and context

Although numerous actors are working actively in the South African arena of food security and food production, there is no proper understanding amongst them of the mandates and responsibilities. This gives rise to the current situation of little or no alignment, coordination or overall collective effort

to address food system deficiencies and causes of food insecurity. Recognition of this situation by the mayor of Cape Town triggered a process of identifying and articulating the city's role and responsibilities in improving the food system and food security in the city area. It is important to note the city council's awareness that a systemic approach and multi-dimensional solutions are needed, not only food support programmes for the poor, to address food security in the city. Until very recently, local government decision makers, policy makers and urban planners did not pay much attention to the food system and how to incorporate it into urban planning – urban planners viewed the food system as largely a rural issue and therefore beyond the scope of the urban planning agenda.

In Cape Town, extraordinary urban growth – at 3% per year, partly due to the democratisation of the country – has brought with it a host of challenges including growing unemployment, food insecurity, a burgeoning informal sector, deteriorating infrastructure and service delivery capacity, overcrowding, environmental degradation and an acute housing shortage.

As a response, the city commissioned a study in 2013 on the food system and food security in the city to find answers to the following urgent questions (city of Cape Town 2013).

First of all, the city council wanted to ascertain what the components of Cape Town's food system are and how effective the system is. To that end they also wanted to identify the weak points in the systems and to determine what interventions were required to establish and sustain an effective

food system in the city. At the same time the council needed to identify the key future threats to the system as well as mitigation strategies.

Secondly, and closely intertwined with the above, the city council wanted to learn the status of urban food security. First they had to establish which instruments should be used to measure food security and what the appropriate indicators are. Also very important was to determine the location and coping strategies of food-vulnerable residents.

The third question concerned which areas within the city's boundaries contribute towards the food systems and food security in Cape Town. Among other things, this entails determining how to quantify the roles of these areas as production food centres, and how significant they are for urban food security.

Lastly, the city council wanted to identify all stakeholders in the field of food security in Cape Town – to discover whose roles are enshrined in official mandates and whose are more voluntary – in order to determine what role the city council itself should play. In other words: what should be the council's response to food insecurity?

Research objectives of the study

The overall focus of the study was to understand the nature of Cape Town's food systems in order to inform city council interventions and policy decisions on improvements in food system efficiency, the alleviation of urban food insecurity, and changes of urban land use. Accordingly, the study specifically addressed: creating a proper understanding of the various elements, inter-dependencies and challenges within the city's food systems; building insight into the extent and depth of urban food insecurity and its drivers/triggers in Cape Town, and ways in which city actors, especially the city council, should respond; and establishing a hierarchy of key problems/challenges in the food system, together with the development of a response analysis and action plans (city of Cape Town 2013).

Approach and execution of the study

The study area was confined by the administrative boundaries of the city of Cape Town, although there are references to regional and country-wide aspects, for example in the section on food flows.

A multi-stakeholder participatory approach was taken to ensure buy-in by relevant stakeholders, and the highest credibility for the study's outcomes. An integrated project management team was set up comprising of both internal line departments and external critical partners such as the provincial departments of agriculture and social development. This team was supported by a reference group which included experts from local and international institutions including the city of Toronto, RUAF Foundation, Mazingira Institute (Kenya), University of Pretoria and FAO.

Whilst the project management team drove the day-to-day execution of the study, the reference group's task was to

comment on and guide the academic/theoretical correctness of the study content and recommended strategic imperatives.

The team encountered a few challenges during the research process. Food security is a complex and multidimensional issue and, on some aspects, good data is lacking or non-existent. Furthermore, the current ad hoc responses to food security made it difficult to identify all relevant actors and their interventions. In addition, some conflicting views caused delay on such issues as how comprehensively certain aspects, for example the agricultural overview and the specific food production areas within the city boundaries, should be covered. Participation by the reference group was also not as expected: during the various phases, only half of its members provided commentary on the results of the study.

Study outcomes

In order to facilitate understanding of the complex connections between the different elements of the food system and where deficiencies may occur in terms of food system activities (City of Cape Town 2014), the study is based on a conceptual framework. These were the main findings of the study:

1. A large number of the residents of Cape Town are exposed to food insecurity, with significantly higher levels in the lower-income areas.
2. As anticipated, at the household level (lower-income) food security is impacted by conditions in the wider food system, e.g., affordability and food safety.
3. Food production areas in and around Cape Town are jeopardised by urban development, resulting in food having to be "imported" from production areas substantially further away from the city. The consequent impact on food price and quality is aggravating the plight of the poor.
4. The livelihood strategies of poor households reflect a range of substrategies to achieve food security; of particular importance is the acquisition of social grants. However, as these substrategies are not sufficient it is extremely important to introduce not only household responses, but also systemic responses to improve and sustain food security.
5. The South African food system does deliver enough food, but it does not ensure equitable distribution and consumption. Though food may be available, it may not be accessible, adequate, and acceptable to all members of society.

Key recommendations

It is important to note that, although the study has been completed and submitted to the city council, it is still under consideration and, as such, the recommendations are neither city council policy nor approved actions. The following are the key recommendations based on the findings:

- a. Establish the conditions for food system governance – through the development of a Food System and Food Security Working Group. This is essential if the city is to develop coherent, effective strategies to address food



Stakeholder mapping exercise. Photo by Verena Bitzer

insecurity and to work towards a pro-poor food system. It is also crucial to build collaborative partnerships with civil society, the private sector, academia and other groups.

- b. Reassess the Agricultural Land Review – this allows the city to consider the implicit and explicit value systems shaping public and private sector decision making within the food system. The city’s Spatial Development Framework calls for the protection of agricultural areas for food security, but the current tools to assess agricultural land do not effectively identify areas of importance to the food system. This reassessment will provide the city with an opportunity to rethink and reactivate the city’s role in the protection of agricultural land for food production purposes.
- c. Develop a coherent, integrated position on food retailing – currently formal and informal food retail are not viewed as being part of one single food system feeding the city. Decisions about retail development are made independently of the consideration of food security impacts. Retail is the main source of food for the urban poor. It is essential that the retail environment provide low-income households with access to affordable, nutritious and safe food.
- d. Incentivise food processing as a growth industry – the food industry already provides many jobs. In particular, small and medium-sized enterprises should be supported. This is important because it highlights the potential role of the food system in meeting some of the city’s broader objectives.
- e. Advocate food price monitoring that is more pro-poor – only better data on the impact of food prices will bolster political motivation to address the problem at the national level.

The way forward

Historically, there has been little appreciation of the role of municipal government in food security, as there is no clear mandate. However, the Cape Town city council realises that it plays a number of important roles in the form and functioning of the various urban food systems. The city plays a

direct and indirect role in many components of these food systems, including production, processing, distribution, sale, consumption, waste management and safety. The city also understands that its existing policies and programmes impact households’ ability to access and utilise food. This is at the heart of this study: “What should be the city’s response to food (in)security?”

Cape Town was the first city in the Southern Africa region to initiate such a comprehensive study of the food system and food security. This provides the city with an opportunity to be a leader and exemplar as food system planning and governance on the African continent grows in importance.

A number of explicit benefits are already resulting from the study. The study has brought together various important actors in food system planning and has led to further research and responses by others. For example, the provincial government is currently developing a food security strategy for the Western Cape Province. A networking group consisting of local, national, continental and international experts and practitioners has furthermore decided to share knowledge, know-how and experience. Finally, the international network group has developed a customised training course to improve the technical capacity of officials and other relevant stakeholders to do food system planning in an integrated manner.

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**The views and opinions expressed in this article are those of the author and do not represent those of the city of Cape Town.*

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City Region Food Systems on the Political Agenda in France

Marketa Braine-Supkova
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Saturday morning market in the City of Rennes (Brittany). Photo by Albane Gaspard / IUFN

Food is back on the agenda of city regions in industrialised countries. A 2013/2014 study carried out in France by IUFN – the International Urban Food Network – reveals that French local governments and actors are involved in a wide array of actions, from the development of alternative food supply chains to the reduction of food waste and the promotion of more sustainable diets. Despite this great number of initiatives, these measures remain largely fragmented. More integrated policies are thus needed in order to echo the systemic nature of sustainable food systems in an urbanised world.

Setting the scene

France is a highly urbanised country. Of its 65 million inhabitants, 79.3% live in a city, with Greater Paris currently numbering more than 12 million inhabitants. The French National Statistics Organisation (INSEE) defines cities (urban units) as places of continuous settlement, and urban areas as those containing a city and its surrounding areas in which at least 40% of the population works in the city. Urban sprawl has become a very important issue in France over the last twenty years. The borders between rural and urban areas have blurred, and the urban way of life has become prevalent among the French population. The term “city region” or *région urbaine* is thus particularly relevant to the French situation, taking urban and rural linkages into account and referring at the same time to the very francophone concept of *territoire* (territory).

French local authorities: an overview of key areas of action

The study revealed five key activity fields related to local food in France. These are, in order of presence on the local agenda: 1) alternative supply chains/short food supply chains, 2) sustainable diets, 3) food waste, 4) food production within cities, 5) protection of agriculture in and around urban areas, and 6) access to food for the poor.

Methodology

The study implemented relied on three different sources:

- a survey of actions put in place by local authorities in France (through an online questionnaire complemented by case studies carried out by AgroParisTech students);
- two focus groups with representatives from urban planning agencies and Chambers of Agriculture; and
- a review of existing scientific and grey literature.

1. Developing alternative food supply chains

Getting involved in local food supply to school canteens or, more broadly, supporting the development of local food chains is definitely among the first and most evident steps for French local authorities starting to address sustainable urban food issues. The scaling up of these initiatives is not easy, as the retail sector is still dominated by supermarkets. For instance, in Greater Paris, even though city dwellers tend to go to markets more often than their rural counterparts,



Unpackaged dried fruit on a local market in the Provence.
Photo by Albane Gaspard / IUFN

62% of fruits and vegetables are still sold through conventional food supply chains. Many of these are indeed adapting to new demands of the urban population with a massive development of smaller convenience stores open until late in the evening.

Short food supply chain initiatives come in many different forms: from Community Supported Agriculture (CSA or AMAP - *Associations pour le Maintien d'une Agriculture Paysanne*) to farmers' markets (*marchés de producteurs de pays*) or producers' shops (*magasins collectifs de producteurs*) such as the one inaugurated in September 2013 in Saint Jacques de la Lande (near Rennes), and from a point of sale at the farm to selling through an intermediary distributor (for instance, *La Ruche qui dit Oui*). In 2012, boosted by technical assistance provided by the national network of Chambers of Agriculture (*Chambre d'agriculture France*), 21% of French farms were involved in at least one form of short food supply chain to sell part or all of what they produced. In the same year, 6% of French residents were members of a CSA scheme.

2. Promoting sustainable diets

Like most industrialised countries, France underwent a major diet transition in the 20th century, leading to a shift towards a higher consumption of meat products and salty, sweet and fat food. Combined with a more sedentary urban lifestyle, factors such as less time to cook and eat – yet easy access to food at all times – produce negative impacts on human health (overweight and obesity, cardiovascular disease) as well as the environment (for example, high GHG emissions related to intensive animal production).

In this context, promoting more sustainable diets is a key challenge for local authorities to address. At least 311 French cities (representing 13.5 million inhabitants) have signed the Active City Charter (*Charte des Villes Actives*) as part of the National Plan for Nutrition and Health (*Programme National Nutrition Santé*) that promotes healthy diets as well as regular physical activity. For instance, the city of Millau (in the South of France) initiated the “One fruit for the break” (*Un fruit pour la récré*) operation in schools, and it organises cooking classes so that parents and their children learn how to cook local produce.

3. Fighting food waste

Only very recently has food waste become an issue in France. Most waste is generated in distribution and consumption, and volumes add up to around 20kg/year per inhabitant, of which 7kg are food items thrown away and 13kg are leftovers from meals.

Local authorities and NGOs have developed a wide array of initiatives in the field of food waste prevention. Awareness-raising activities or community-based social marketing projects help household members realise how much waste they produce and teach them how to reduce it. Indeed, raising awareness is still crucial: when asked about producing food waste, two-thirds of the population estimate that they produce less than the average 20 kg/year per inhabitant.

Supporting the reduction of food waste in school canteens and providing collective composting bins in apartment blocks (as implemented in the city of Nantes) are examples of actions taken by local actors. Local authorities are also increasingly involved in connecting “food waste producers” with “food waste consumers”, be it through specific events (for example, *Disco Soups* – organised in a number of French major cities including Strasbourg, Lille and Rennes – that gather hundreds of people at a festive event to produce a soup with food that would otherwise be thrown away) or more traditional social business activities such as redistributing food through food banks, or using it as a raw material for making jams, preserves, etc. Today, all these efforts are also supported by a national policy on food waste management (*Pacte national de lutte contre le gaspillage alimentaire*) with a target of reducing total waste volumes by half by the year 2025.

4. Integrating food production into the urban fabric

Urban agriculture refers to a wide range of initiatives proposing new forms of urban food production – community gardens, roof top gardens, vertical farms, urban farms. Also, households with garden space but no wish to cultivate it can be linked to interested gardeners through digital tools (such as *Prêter son jardin* or *Plantez chez nous*). Some local authorities have provided steady support for urban agriculture activities. For instance, the city of Rennes has put in place allotments since the 1970s, and started supporting community gardens in the mid-1990s. The *Agrocité* project in Greater Paris (Colombes) puts food production at the heart of a “resilience initiative” that links an experimental farm and community gardens with eco-homes built through a participative process.

Even though growing food within cities is unquestionably gaining renewed attention from local authorities, citizens and civil society organisations, data is still scarce on urban agriculture practices in France. For instance, though we know that, in 2010, 8% of French farms were located in urban units numbering more than 100,000 inhabitants and 14% of people living in the Greater Paris area produced food, the extent to which this production covers their needs is not yet known. Issues related to soil contamination and possible health impacts of urban agriculture are also largely under-investigated. The French research community is actively contributing to such new research, for example through the [JASSUR](#) research project.

5. Protecting agriculture around cities

Agriculture is a key component of French city regions: nearly half of French farms are located in urban areas, i.e., under the social, economic and cultural influence of a city. The preservation of arable land is thus high on the local authorities' agenda.

Although a wide array of planning tools exist to protect agricultural land, such as *Zones Agricoles Protégées* (ZAP) or *Périmètres de Protection et de mise en valeur des Espaces Agricoles et Naturels Périurbains* (PAEN), the dissemination and actual use of these tools seem to be the major challenge. Also, policy designed to protect agriculture around urban areas needs not only to focus on land preservation, but also take into account all the additional land required for agricultural activities (for buildings, storage, etc.) – not arable land *per se*, but crucial to such activities. As put forward by a representative from a Chamber of Agriculture during the focus group: “agriculture is not only about arable land”.

6. Fighting food insecurity

Although food insecurity is a growing problem, it is still not high on the local food agenda in France. Figures show that approximately 12% of France's population has difficulties accessing a well-balanced diet because of a lack of financial resources. Food insecurity is exacerbated in deprived urban neighbourhoods, where it is three times higher than for the rest of the population.

In 2014, 3.5 million people in France benefitted from food aid. In questioning food aid because it does not foster users' empowerment and autonomy, other forms of aid – based on solidarity mechanisms in which users pay a small proportion of the food's total price – have been developed through Social and Solidarity Grocery Shops (*Epiceries Sociales et Solidaires*). The study also revealed that local initiatives increasingly search for a better connection between social and environmental dimensions. Indeed, a number of CSA schemes are developing special offers for low-income households.

Going further: towards integrated food policies

Overall, the French study shows that a large number of initiatives are being developed to contribute to a more economically, socially and environmentally sustainable food system. These are a great starting point.

However, key challenges remain. One such challenge today is to foster a more integrated approach to food that not only tackles specific challenges or issues associated with one

specific part of the food chain (such as production, transformation, distribution, waste), but also considers the food system as a whole. From a technical perspective this would imply, for instance, carrying out comprehensive local food system assessments as opposed to many, separate, diagnostic studies (one for food poverty, one for agricultural land, etc.). From a governance perspective, food-related issues have traditionally been tackled in sector-specific policies and plans (agriculture, health, food safety, social policy, etc.). However, since the 2000s, in the wake of sustainable development policies, an integrated “food policy” is emerging at the national level that brings together existing sector-specific policies and builds upon them. Recent calls for such a – more integrative – approach include a [2014 report](#) conducted by the Economic, Social and Environmental Council (CESE - *Conseil Economique, Social et Environnemental*), a government advisory body, that asks for more coherence and complementarities in food policy.

Local authorities have a huge role to play in facilitating a constructive dialogue between stakeholders from the public and private sectors in order to design relevant and long-term-oriented local food policies. For instance, last year the Nord Pas de Calais region organised a [public debate](#) around food issues that gathered all regional stakeholders. In cooperation with the research community, local authorities also need to produce data and the evidence base for developing and monitoring sound policies – such as when Nantes Métropole worked with academics to identify derelict agricultural land within its boundaries.

France's regions have been particularly active on the matter, officially contributing to the recognition of the city region as a relevant scale of action in the field of local food policies. In July 2014, the regions' representative body (ARF - *Association des Régions de France*) adopted the [Rennes Declaration for Territorialised Food Systems](#) (*Déclaration de Rennes pour des Systèmes Alimentaires Territorialisés*). This Declaration clearly sets out how regional authorities can contribute to more sustainable city region food systems, for example, by creating labels so that consumers can identify regional products, by supporting innovative local actions through financial or technical help, or by creating regional networks for local initiatives.

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Sustaining Grassroots Initiatives and Institutional Roles in the Urban Food Policy of Milan

Andrea Calori

Citizen involvement at an urban agriculture event in Milan. Photo by Andrea Calori

In the last years throughout the Lombardy region, hundreds of local projects and initiatives have been developed by social movements and networks on issues that address local food production and consumption from a sustainable perspective. After years in which these dynamics have been generated and consolidated into social processes, institutional innovations are now emerging that hold promise for changing the current state of separation between territorial, agricultural and rural policies.

An urban food policy launched in the city of Expo 2015

From May to October 2015, the city of Milan will be hosting Expo 2015 with the title “Feeding the Planet, Energy for Life”. The upcoming Expo boosted interest for food in Milan, and a wide range of events, debates and projects have been organised in recent years. As well, the past 10 to 15 years have brought social dynamics in the city which have helped in considering food as a key issue in civil society debates and this has generated projects and also very solid social movements.

In this context, the local municipal government decided to promote an urban food policy for the city, looking also to the wider context of the metropolitan area that plays an important role in food issues at the city-region level. The idea of the food policy is connected to other recent decisions of the city council to invest in creating a more sustainable city, especially through specific programs for urban mobility and for

waste management which have placed Milan at the top of the world rankings in these fields. In February 2014, during the last annual meeting of C40, the world network of big cities working on climate change issues, the mayor of Milan announced an urban food policy.

The perspective of Expo 2015 bolstered the decision to develop the urban food policy, yet the municipality is looking far beyond that event. The food policy is an important part of an ongoing strategy towards sustainability and quality of life. The food policy aims to connect a variety of actions and policies: from the existing local networks of bottom-up food experiences, to relevant EU policies that affect the metropolitan area, and to a number of decentralised cooperation projects with other cities around the world – including those in the global South – that are supported by the municipality of Milan.

The municipality has set up a “control room” that addresses all the activities of the urban food policy. The cabinet of the mayor has to guarantee the connection between all the activities of the different members of the municipal government that are relevant for the urban food policy. The *Carplo Foundation*, a non-profit banking foundation, co-funds the entire project and in many ways has been an important driver for establishing an urban food policy in Milan. *Està (Economia e Sostenibilità)*, a non-profit think tank, provides scientific and technical support for the management of the process and related research activities.

Assessing the Milan food system and its territorial context

The process of developing the Milan food policy is to occur during a five-year period. In the first phase, from summer

2014 to end 2015, an initial assessment of the urban food system and its territorial context is being made. This food system assessment is not oriented towards an in-depth analysis of specific issues, but rather aims to define an overview of key issues and dynamics that are connected to food: flows, actors, dynamics, impacts on social, economic and environmental aspects, etc.

The synthesis of the assessment was published in March 2015, with a selection of data and the interpretation of the main dynamics concerning different elements of the food cycle (production, processing, logistics, distribution, trade, consumption, waste disposal). The synthesis also covered key information about socio-economic trends, lifestyles, environmental and territorial issues, in order to understand the drivers and impacts of the food system.

Consultation and participation

The second phase of the Milan food policy process consists of formalised participation and consultation between March and autumn 2015.

The participatory process is divided into two steps: the first is an open consultation to better define, integrate and agree on the document that declares the general objectives and the guidelines for the Milan food policy. The consultation is organised with public events in different zones of the city and with a series of thematic meetings and workshops. The results of the consultation will be submitted to the executive board and the city council of Milan for institutional approval.

The second step of the participatory process is dedicated to actors who will actually implement the objectives of the food policy into projects and actions. Events called “*Food malls*” will facilitate the development and start-up of concrete actions and projects by organising a market of ideas, actors, projects, knowledge and financial supporters.

Farmers and consumers as new actors for urban food policies

In Milan over the past 10 years there has been an increasing convergence of several issues: sustainable consumption practices, various cultural sensitivities, the effects of the economic and environmental crisis, the emergence of new types of social relations based on social and solidarity economies, and other socioeconomic trends related to both sustainable lifestyles and different ways of conceiving and managing the relations between food production and consumption.

After years in which these dynamics have been generated and consolidated into social processes, some institutional innovations are now emerging that hold promise for changing the current state of separation between territorial, agricultural and rural policies. In this innovation process, a significant role has been played by the “*Solidarity Economy Districts*”, which represent territorial coalitions mainly composed of networks of community supported agriculture initiatives that, in Italy, are called GAS (*Gruppi di Acquisto Solidale*: Solidarity Purchasing Groups). Despite the fact that

these are informal groups and networks, they have been (and are) an important driver of change toward a more sustainable urban food system.

More recently, four agricultural districts were created in the metropolitan area of Milan as a result of the dialogue between active farmers and local authorities. These districts are formalised under a national law which supports the aggregation of enterprises interested in working together for the overall improvement, upgrading and qualification of food production, though without a specific orientation towards more sustainable production. This law is now being applied for the first time in the rural context in the Milan region, following a cooperative approach to also define new roles in different policy areas.

One of the main challenges that the Milan food policy process faces is to facilitate the interactions between these “horizontal” socio-economic organisations, in order to support the transition towards a more resilient urban food system. The idea is, on the one hand, to take advantage of both the innovations and the social pressures that are supported and channelled by the solidarity economy network; on the other hand, it is to cross-fertilise the social innovation coming from these actors with more traditional market actors.

The urban food policy of Milan is dedicated not only to urban and periurban agriculture, although these elements are certainly important and are at the centre of many issues that received attention during the food system assessment. One of the results of the first phase of the food policy process should be the possibility to test the potential of establishing more formalised agricultural districts to create economies that can exploit the activities of small and medium-scale farmers, even in a urbanised context. Another important ambition concerns the scaling up and formalisation of current, widespread practices of exchange and local alliances between producers and consumers into policies that could include the use of new organisational and financial instruments (ethical finance, microcredits, mutuality, etc.).

Finally, a general aim to be achieved with the Milan food policy is to strengthen the capacity of urban and periurban farmers, together with consumer groups, to become “new actors” in urban policies through negotiations with local authorities for land-use plans, and in working towards a common definition of agricultural and rural policies.

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Building a Bristol Food City Region from the Grass Roots up: Food strategies, action plans and food policy councils

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Dan Keech

FareShare bike. Photo by Matt Reed

The City of Bristol, in the southwest of England, is blazing a trail in trying to integrate sustainable and healthy food production within its vision as the 2015 European Green Capital. If the topic of food and urban agriculture is to form a part of Bristol's Green Capital programme and legacy, it will be as a result of a long and complex process of organising and lobbying within the city by networks of community food activists. In many ways the networks of food activists in the wider Bristol area are creating a food city region from the grass roots upwards. This article explores the problems perceived by Bristol activists in relation to "mainstream" agriculture and food as well as regarding the formation of their networks; it also highlights two case studies of innovative and multifunctional initiatives. In addition, the article analyses how grass-roots networks have attempted to influence food policy in the city.

The challenge for the authorities of Bristol City is to demonstrate that efforts by food activists are contributing to meaningful change in the city. After a polite, non-political and open round of lobbying, the activists have much invested in

the possibilities of change. However, recent protests between those trying to protect high-grade soil on the edge of the city on the one hand and on the other hand the City council that wants to build a low-carbon mass transit system on that land, reveal that reconciling competing environmental goals is not easy. After years of talking about possibilities, the year of the Green Capital signals for many the need for results.

The city region of Bristol is a concept with historical precedent: between 1974 and 1996 the cities of Bristol and Bath, including their rural districts, were administratively united within the County of Avon. Subsequently, the reorganisation of local government presented the possibility of continuing the two-tier county-district system or choosing unitary status in which district authorities assume full responsibility for the provision and organisation of public services. In the case of Avon the latter option prevailed, leading to the establishment of four new single-tier authorities: Bristol City, Bath and North East Somerset, North Somerset, and South Gloucestershire. Furthermore, in the international SUPURBFOOD research project, the University of Gloucestershire has explored how a city region perspective aids the understanding of efforts to support sustainable environmental flows and short chain food systems in the Bristol city region corresponding to the four administrative areas described.

"Mainstream" food and activism in Bristol

Bristol has a population of about 435,000, with an economy historically founded on global colonial trade. Today its commercial importance lies in aerospace technology, finance and creative industries and it is well known for its

FareShare challenges food poverty

FareShare South West is among several initiatives in Bristol city region to address food poverty. FareShare is a national charity, and the Bristol branch is the headquarters of its south-western region. FareShare redistributes perfectly edible food that might, due to standardised supply chain practices, otherwise go to waste in the food chain, including products with superficial damage to packaging, surplus orders or foods nearing their recommended sell-by dates. By donating such products, food companies avoid waste disposal levies and contribute to corporate social responsibility. FareShare arranges for this food to be

delivered to their warehouse, where their staff and volunteers re-allocate it to a wide range of local charities for below-market prices. Clients include homeless charities, community kitchens and youth centres. A key feature of the FareShare franchise model, which currently has 20 depots across the UK, is that volunteers support a team of core staff. These are people from a wide range of backgrounds including environmental activists, welfare recipients and those seeking to enter the labour market. FareShare supports them with formal and systematic training and vocational accreditation.

vibrant, bohemian culture and diverse population. Bristol is home to early works by the famous street artist Banksy, supports many forms of urban music and has a thriving arts scene. The city sits at the gateway to the rural southwest, the English region most economically reliant on agriculture. Food and agriculture are, however, largely outside of the control of local politics. The regulation of food is principally influenced de facto by the multiple retailers that supply about 80% of UK groceries. In terms of spatial planning the food system has a profound impact on the urban landscape, defining not only the built edges of the city but also the streetscape. Local authorities have limited powers to control the development or location of individual stores. All of this has led to site-specific tensions but also a wider context for the way in which people experience cities.

Much of the criticism against the dominant food system (dramatically so in the case of Bristol, where violent riots accompanied fierce opposition at the opening of a super-market branch) emerged from an increased awareness in Bristol about its reliance on fossil fuels. This became especially evident during fuel distribution boycotts in 2001 resulting in tangible food shortage threats. Concerns about the food system are also associated with the CO₂ emissions of agriculture, food transport, refrigeration and post-retail consumer practices, all of which exacerbate global warming. Recent flooding in or near the cities of Gloucester and Bath demonstrates how vulnerable the area can be to increasingly extreme weather patterns. The sharp oil price rise during the recession, followed in 2014/15 by a dramatic drop, reinforced the link between volatile oil prices and the price of food in a very direct way. Despite food price falls, many vulnerable households have inadequate family budgets to meet nutritional standards and, consequently, are in need of food support. This widespread food security challenge, affecting people in work as much as those who are jobless, is new in the UK and underlines another type of food system vulnerability.

The intersection of the environmental, social and community factors has provided the driving force for a diverse

network of civic food initiatives in the city region. To describe, or even map, food initiatives in the city region is challenging in terms of number, scale and scope, but we estimate that there are more than 200 groups. In scale they range from those involving hundreds of people, such as *The Community Farm* (see box), to those focused on neighbourhoods, such as shared gardens. In scope they range from initiatives to fight obesity through operations such as food waste cafes and food banks to those attempting to resurrect artisan food skills. Without central coordination there are areas of overlap and even redundancy; some initiatives are well organised and networked, others fizzle out quickly. Most organisations are no- or low budget and rely on finding points of leverage to create change.

An important civil-society intervention was the formation of the *Bristol Food Network* (BFN) in 2009, registered as community interest company in 2014, to promote a set of key goals, including:

- Encourage people to cook from scratch, grow their own and eat more fresh, seasonal, local, organically grown food.
- Champion the use of local, independent food shops.
- Encourage the use of good-quality land in and near the city for food production.
- Promote and encourage the redistribution, recycling and composting of food waste.
- Advance nutritional education and social cohesion.
- Promote community-led food trade.

This wide platform has become one around which a wide range of groups can gather, and includes those concerned with radical social transformation of the food system, those advocating diet changes, and locals who wish to cultivate a patch of ground in their neighbourhood.

Food strategies, action plans and the Bristol Food Policy Council

In 2009, BFN wrote a *Sustainable Food Strategy* for Bristol, which stimulated the City Council to develop its own ten-point food charter. This effectively became an unofficial food strategy to support public-sector food procurement. The

charter was a significant step forward and improved communication between staff from different sections of the Council in a Food Initiative Group.

Another key resource in further developing the food network was the publication of the report *Who Feeds Bristol?* written by experienced and influential food campaigner Joy Carey and commissioned by the local National Health Service (NHS). The report, which has become an exemplar for other cities, was “*primarily a descriptive analysis of the food system serving Bristol*” but, for the first time, provided a wide range of information about the operation of the food system in the southwest region. This ranged from the number of independent food shops (140), through an exploration of the concentration of supermarkets in Bristol, to a description of food infrastructure (wholesale markets, abattoirs) in the wider southwest of England. Apart from secondary data sources, it included some interviews and “snapshot surveys” with selected food businesses. Despite its constraints, the report provided a key resource for discussing Bristol’s food system and how a closer integration might be created between the productive rural areas and the consumer markets of the city region.

A further development, in March 2011, was the formation of the *Bristol Food Policy Council* (BFPC), modelled on precedents in North America, notably Toronto, Canada. BFPC’s establishment followed some earlier experiments in the UK to coordinate food policy within municipal government, such as Greater London Food Policy Council in 1984, London Food in 2004, and Sandwell Healthy Urban Development Unit in 2008. With members drawn from a wide range of stakeholders including local food industry, Bristol City Council, Bristol Food Network, universities and grass-roots bodies, it set itself the goal of promoting “Good Food”, defined as being “*vital to the quality of people’s lives in Bristol. As well as being*

tasty, healthy and affordable the food we eat should be good for nature, good for workers, good for local businesses and good for animal welfare”.

The recommendations from the *Who Feeds Bristol* report have now become the basis for the *Bristol Good Food Plan* framework, launched in November 2013. The next step in 2015 is to develop a more detailed action plan with clear commitments, outcomes and success measures. The Food Plan aims to help different actors to participate in an integrated, sustainable food vision for the city, and represents a mechanism for people to coordinate discussion and work. Although not formally part of Bristol City Council, the BFPC and its *Good Food Plan* gained the official support of Bristol’s Mayor. Other achievements of the BFPC include a City Council review of food in relation to strategic development. Despite these encouraging developments, activists still face challenges, including the City Council’s approval to develop land adjacent to the M32 motorway for public transport infrastructure development. Campaigners had long argued that this high-quality land should be dedicated to meeting some of Bristol’s food needs.

Food activism, innovation and system change

The networks of Bristol food activists have been able to lever considerable change with well-timed and well-executed *discursive* interventions. The Bristol Food Policy Council holds a seat open for a representative of the multiple retailers, and that symbolic space captures the food network’s struggle to influence mass consumers and producers. As yet the city region has limited powers over the food system, and it is unlikely that quick or deep changes to that system can be made.

However, as the examples of *FareShare* and *The Community Farm* (see boxes) demonstrate, there are niches available in

FareShare challenges food poverty

The Community Farm (CF) is a community-supported and cooperatively owned farm on the periurban fringe of Bristol, about 11 km from the city centre. The CF seeks to combine producing sustainable food with the development of a social community linked to the farm. The CF was founded in 2011, initially growing organic vegetables on nearly 9 hectares. Initially run as a private enterprise, the CF had a voluntary steering group that gradually solidified the organisation of the CF, attracting a donation of £20,000, and a part-time organiser who re-established the CF as a Community Interest Company. Thereafter, over 400 individual cooperative investors raised a further £126,000 to finance CF’s development. The CF’s main commercial activities are a box scheme for organic vegetables, retailing at farmers’ markets in Bath and Bristol, and a wholesale

business that supplies local caterers and restaurants. While the CF employs professional growers, volunteering is a key element to develop a community around the farm. Such unpaid labour comes in the form of regular weekly workers, monthly family groups or one-off visitors, and fee-paying corporate team-building parties. CF also runs formal horticultural apprenticeships in collaboration with the Bristol Drugs and Alcohol Project (BDAP) which is funded through the National Health Service. The various working opportunities fulfil a range of different operational, horticultural and social functions, as well as offering city residents a hands-on opportunity to learn skills, make friends, enjoy the open air and learn about the source of their food. In 2014 the CF was a runner in the BBC TV “Farmer of the Year” competition.



Tractor at The Community Farm. Photo by Matt Reed

the food system for *practical* interventions. Both cases demonstrate a high degree of operational effectiveness; in the former case, to lessen the wastefulness of mainstream food distribution and, in the latter, to create a multifunctional agricultural concept. Nevertheless, they also face limitations. *FareShare* relies on the food system's wastefulness to further its social goals, while *The Community Farm*, in providing several non-commercial functions, tries to fund these through its trading enterprise, albeit with voluntary work and solidarity investments. Both cases thus demonstrate the capacity for the network to create alternatives – although these are not disrupting the dominant food system, but operate in parallel to it. By demonstrating that an alternative is viable, these projects provide an important service not just to those who directly benefit from each initiative, but also to the wider collective imagination of the food network. In this way the practical initiatives represent forms of discursive intervention, demonstrating viability and providing inspiration for further action.

Conclusions

The Bristol example shows that citizens' activism has been highly influential in several ways. Firstly, the ability of people to organise themselves into formal and inclusive networks, particularly BFN and BFPC, has inspired policy engagement with sustainable food within the City Council, particularly under the championship of an elected, independent Mayor and with opportunities linked to Bristol Green Capital. Secondly, the effective communications of these networks and their expertise has generated a wealth of food-related knowledge and goodwill with positive implications across

public, private and voluntary sectors. This, in turn, encourages further localised actions which underscore the multiple values and social/environmental functions of urban food production and also present compelling arguments for a more diversified food economy. Thirdly, the nature of Bristol's food initiatives, which include new financial, organisational and retailing methods, have led the city to become a place for food innovation in the southwest.

These achievements, however, face a number of persistent challenges, including the continuing absence of a food strategy for Bristol, in contrast to the publication of a food strategy, in March 2015, in neighbouring Bath and North East Somerset. The strategic review of Bristol's development policies in 2016 offers new hope in this respect. However, it is noteworthy that the *Who Feeds Bristol?* report was initially encouraged by the public health service, which has limited influence over urban land use, retailer profiles and peri-urban agricultural policies. All of these are ingredients which BFN identifies as key for a systemic sustainable food approach.

The city region concept has undoubtedly helped cast Bristol within, and not separate from, its productive hinterland. Experiments leading to the delegation of central government funds to city regions have begun to raise the prospect of a Bristol-Cardiff-Newport "super city region" which would further expand the productive area from which food can be drawn. This could benefit from Welsh government attempts to support local food in public procurement and regulate the carbon impact of development. If Bristol's grass-roots networks can successfully recreate helpful political and financial supports, things could be looking up.

With the status of European Green Capital, the expectations for demonstrable change have grown. The network of food activists has demonstrated that they can deliver new ideas, policy contributions and practical examples of change. Many key resources to creating wider and more systemic food-system change lie within the control of the local state. The challenge for those in local government is to match the constructive and civically minded contribution of the food activist network. The next eighteen months will see if Bristol develops into the beacon it has frequently suggested it could become.

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Policies Fostering Multifunctional Urban Agriculture in the City of Zurich

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City-owned farm Huebhof in Zurich. Photo by stadtmues.ch

In the city of Zurich, Switzerland, policies for agriculture in urban areas have evolved towards fulfilling multiple functions. The production of food is a part, but not the main goal, of a multifunctional approach that reflects the aim of ensuring diverse services for city dwellers. This multifunctional approach fosters biodiversity and provides both an attractive recreational landscape and education opportunities for city residents. The city administration has implemented various support mechanisms to ensure the implementation and maintenance of the multifunctional concept.

Multifunctional land use as overall approach for urban agriculture

As cities grow, politicians and urban planners are increasingly faced with competing claims for urban land use. A concept trying to overcome these competing claims is multifunctional land use, which aims to fulfil different functions within one area. This concept has been recognised by the city of Zurich as a way to ensure green spaces within the city. In Zurich, fostering agriculture is a vehicle for addressing multifunctional land use goals. The city department in charge of green space management has defined diverse goals for its agriculture: (i) design and maintain an attractive cultural landscape with high recreational value, (ii) preserve and promote biodiversity, (iii) produce food, (iv) facilitate

“green knowledge” and opportunities for participation among city residents. These goals are to be realised on 810 ha of agricultural land in the city, which accounts for 10 % of the town area. The city of Zurich has 25 farms run full-time or part-time. Ten of these farms, working 500 ha of the total agricultural land, are owned by the city. Nine farms are leased to family farmers, and one is directly managed by the city department in charge of green space management. Furthermore, approximately 5,500 allotment gardens on 135 ha and 20 community gardens, migrant gardens, or hobby animal holdings (sheep, bees) are established on 2.8 ha of city-owned land.

The existing agricultural land is considered to be secure within the current long-term land planning formally outlined in a structure plan. In recent years, the city of Zurich pursued a strategy of condensing settlements by building upwards rather than expanding the built area into the surroundings. Nevertheless, numerous interests exist for land within the city, and the pressure to release valuable green space for construction is increasing. This has resulted in an active land-buying policy by the city department in charge of green space management: they buy land from private or public owners in order to safeguard city green spaces. Politically, the protection of agricultural land is still of high importance among the population. This was revealed in 2012 in a public vote on the maintenance of agricultural land, and justifies the city agricultural land-buying policy. However, as the pressure on agricultural land continues for uses such as housing, sports facilities and leisure parks, many farmers and urban gardeners are anxious about the long-term perspective for their farming and gardening activities.

Multifunctional urban agriculture as a source of conflict

The Zurich city department in charge of green space management has put in place various measures to assure the above-mentioned goals. The main pillars are (i) binding requirements for organic farming practices for city-owned farms and urban gardeners (allotment and community gardeners); (ii) support and advice for agro-ecological measures on farms, etc.; (iii) investment funds for infrastructure such as on-farm shops and animal-friendly stable constructions; and (iv) fostering of environmental education activities (“green knowledge”) among school children by supporting school excursions to farms. Within these measures, the main focus is on nature conservation in terms of agro-ecological measures (e.g., flower strips in arable land, planting and maintenance of hedges and high-stem fruit trees). In order to obtain direct payments within the Swiss agricultural support scheme, farmers in Switzerland must carry out biodiversity measures on 7% of their utilised agricultural area as well as fulfil other ecological minimum requirements. City policy in Zurich requires that biodiversity measures be implemented on 15% of city-owned agricultural land; in 2014, these reached 30%. Furthermore, 53% of all agricultural land in the city (publicly and privately owned) was cultivated organically. This result was achieved due to specific biodiversity and organic farming payments based on national funds as well as advice and city-specific programs such as “10,000 fruit trees for Zurich”, under which farmers get trees for free and then cultivate them according to biodiversity guidelines.

Nature conservation, though, often creates conflict for farmers in their decision making, particularly for city farmers who farm on private land. There is a perceived conflict between production of food and carrying out agro-ecological measures. Although implementing such measures has the potential to contribute significantly to farm income, farmers are partly critical as they believe it is at the expense of agricultural food production.

Not only farmers, but also civil society actors are involved in cultivating land within the city. The long-standing tradition of allotment gardening has resulted in defined areas for allotments throughout the city. This is not the case for the new urban gardening initiatives. The department in charge of green space management provides land for urban gardening initiatives, but this land is often in residual fields. Some urban gardening initiatives wish to get land on city farms. The department in charge, however, is ambivalent on this issue since more agricultural land for gardening initiatives means less land available to farmers – who are currently the main actors driving multifunctional urban agriculture.

Need to reconsider public policy on multifunctional urban agriculture

The policy goals for multifunctional urban agriculture are mainly framed along the lines of the national goals of Swiss agriculture, where important goals are the maintenance of the cultural landscape and nature conservation in terms of fostering biodiversity. One reason for using the rather rural definition of agriculture might be that farmers are mainly supported by agricultural funds at the national level. The city



Photo by Marianne Nitsch

provides additional funds for their farms. Nevertheless, as referred to by municipal authorities, supporting city farming is a “cheap form of land conservation”. The city administration is dependent on farmers in order to fulfil its multifunctional land use goals. Farmers, however, have in part different land use goals in terms of conflict between nature conservation and food production, as mentioned above. One possibility for overcoming this is to broaden farmers’ definition of “producing” to include “producing food and nature”. This needs to be addressed on a national level, however, as representatives of the mainstream farming associations are generally sceptical towards the strong emphasis on nature conservation on agricultural land. In their opinion, food production should be the main goal.

The land-based policies and measures taken by the city of Zurich are considered innovative by farmers, by civil society and also by city administration itself. Nevertheless, focussing only on land-based policies mainly framed along the lines of a rural definition of agriculture seems to be too narrow, considering the multiple environmental, social and cultural aspects that can potentially be addressed through multifunctional urban agriculture. Rethinking the goals and measures of multifunctional agriculture towards an urban approach could also include civil society actors as actors who potentially fulfil other aspects of multifunctional land use than farmers. A sound reorientation of policy goals would need to integrate farmers as well as civil society actors in the elaboration of the multifunctional concept for urban agriculture. This could lead to an institutional platform between city administration, farmers and civil society actors: for sharing a vision and fostering cooperation in order to deal with the various conflicts over land claims. It would also provide the chance to promote a more integrated image of urban agriculture, not only focussing on the environmental framework of how food is produced, but rather considering food from a more cultural and participatory perspective. This also has the potential for highlighting the multiple functions of urban agriculture and finding new arguments for protection of agricultural land within the city.

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Governance Challenges for the Development of Public Green Areas as Edible Landscapes

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Elderflower tree. Photo by RoomER

Over the last years, citizens of Ghent have developed many urban food initiatives; they include farm plots on brownfields, local food distribution systems and a rooftop farm. Because of interest in developing community activities and food production, Ghent's citizens increasingly want to develop urban food activities on *public land* (e.g., land owned by the municipality). Many neighbourhoods organise themselves to develop community gardens, a practice which is often both financially and institutionally supported by the Ghent city government. Less known and less institutionalised, however, is the phenomenon of gathering food products on public land, outside of a garden context. We define gathering as "a practice that involves the removal of fungi, plants, or parts of plants with the intention of using the materials for foods, medicines, crafts, fuel, ceremony, decoration, or exchange" (Poe, McLain, Emery, & Hurley, 2013, p431).

The practice of gathering food products in public nature areas and parks in city regions is gaining momentum in Europe and North America. Educational forage walks are

well attended. Online you can find wikimaps showing where edible plants are located in cities across Europe, and information is documented in the [Pocket Urban Foraging Guide](#). Among chefs as well, wild ingredients are increasingly popular, and in Ghent two liquor producers apply this practice to obtain ingredients for their alcoholic beverages (see box). These examples demonstrate that the activity is not only limited to citizens gathering products for home consumption; foraged products are also commercialised.

In their book, Laird et al. (2010) argued that "*Studies in rural areas suggest that gathering can be a sustainable practice depending on the confluence of many factors, including tenure rights and responsibilities, the degree to which products enter into global market systems, the rates of regrowth relative to removal rates, and pressures from competing land uses*" (Laird et al. 2010 in McLain et al. 2012, p. 193). Furthermore, gathering food and resources in the city can make positive contributions to the development of a sustainable city region food system for reasons described below.

First, observing or participating in gathering or the consumption of a product with locally foraged ingredients allows local communities to establish, or re-establish, a direct relationship with the nature they inhabit and to reconnect with their food (Poe et al., 2013; Travaline & Hunold, 2010). Second, many wild plants are known for their high nutritional value in terms of micronutrients and have the potential to diversify citizens' diets. Third, the practice of foraging and gathering stimulates more productive multifunctional use of public space. It opens up opportunities to integrate foraging practices in the management of green public space, which can result in win-win situations for the government (e.g., reduc-

RoomeR

RoomeR produces an alcoholic beverage based on the flowers of the elderberry tree (*Sambucus nigra*). The production of this aperitif started on a very small scale in the owners' garage and in their grandmother's attic, but slowly it developed into a well-established local business producing an average of 50,000 litres per year. The business practices include a conscious decision not to produce elderflowers on a farm plot, but rather to gather the flowers from trees located in a number of green areas in and around the city. "Elderflowers appear plentiful in green areas and the harvest of these flowers can be incorporated in the sustainable management of these areas. If we were to produce elderflowers intensively on a farm plot we would in fact waste land and energy" (CEO RoomeR).

On average, the company collects 1200 kg of elderberry flowers annually. The flowers are selected at least 5 km from a highway and 1 km from the railway, and polluted areas are strictly avoided. To guarantee full traceability, the location of the collected flowers is carefully registered. Finally, the method used to harvest the flowers safeguards the reproductive capacity of the trees.

To access nature areas the business established informal agreements with public and private landowners (e.g., nature organisations and estate owners). However, despite the potential advantages, RoomeR has not yet established

formal agreements with public landowners. The city's green management department was not willing to experiment with an official agreement, primarily because the harvested product would be commercialised. Furthermore they argued that the number of trees in the city is limited and not sufficient to allow for harvest by both citizens and a commercial enterprise. In order to manage risks and secure harvest, RoomeR decided to depend only partially on gathering flowers in nature areas; the business purchases an average 30% of its flowers from an organic producer located 30 km from Ghent.

Ginderella

Ginderella produces an alcoholic beverage with a mixture of weeds such as Japanese knotweed (*Fallopia japonica*) and ground ivy (*Glechoma hederacea*) that are gathered in the green public and private areas of Ghent. The small business is in its start-up phase and was the result of a project called "Niets gaat verloren" (Nothing is Lost). For this project, citizens were challenged to propose creative solutions for the problem of wasted resources including invasive species such as the Canada goose (*Branta canadensis*) and weeds. This resulted in the development of a gin named Ginderella. The product is now commercialised and sold in several restaurants and web shops throughout Flanders.

tion in management cost) and entrepreneurs (e.g., access to land and marketing opportunities). The cases displayed in the boxes are interesting examples of productive use of otherwise wasted urban resources.

However, despite the fact that foraging is commonly practiced by citizens and, recently, by entrepreneurs, the productive use of urban plants is still based on informal agreements (McLain, 2012). To make further development possible, potential new governance mechanisms will need to be developed. As part of the European research project SUPURBFOOD, an aim was to establish an agreement between the city government and RoomeR to allow the harvesting of elderflowers in green public areas of the city. We explored what institutional challenges would need to be addressed in order to further stimulate productive use of public urban spaces in Ghent.

A first challenge is the fact that the formal legal (land-use) documents reflect a non-production perspective on public nature areas and parks (see also McLain, Poe, Hurley, Lecompte-Mastenbrook & Emery, 2012). In nature reserves, including forests, it is forbidden to intentionally pick, collect, cut, or harm plants (Natuurdecreet, Article 4§6.6, Bosdecreet 97§1.3). Also, legal documents developed at the city region level do not allow for any removal of plants in green public spaces. Interestingly, despite this legislation, the Ghent city administration responsible for green management does

tolerate the gathering of products meant for home consumption. On a number of occasions they have given organised groups permission to harvest fruit in orchards located on city domains for home consumption. Furthermore, the city government regularly plants edible shrubs and herbs in public parks. Nevertheless, the city is currently faced with unorganised gathering practices that result in plundering and damaging of herbs and fruit trees. Simply allowing foraging or gathering products to all citizens would therefore not be sufficient for the development of sustainable forage practices. The city will have to invest additionally in developing a culture of sharing, and people must be educated about plants and good harvesting methods.

In order to take advantage of the potential for a productive city landscape and to allow commercialisation of foraged products, current land-use regulations will need to be adapted and the necessary conditions and requirements will need to be identified for sustainable gathering of food ingredients in public areas. For example, potential soil contamination in public areas will need to be investigated and taken into account.

The city government will have to explore possibilities for governing green areas that accommodate both the collective use of these areas (recreation, nature value) and a

Promoting productive use of public open green areas in Burkina Faso

As in Ghent, land use and management of open urban green spaces in Bobo Dioulasso, Burkina Faso was limited to non-productive land use only. However, after recognising the potential of using such spaces for agriculture and agroforestry production (fruit trees), the city council adopted a change in land-use regulations, including urban agriculture and forestry as a legitimate land use for these areas. They also established a municipal management committee to oversee future multifunctional (production, recreation and leisure) community use of these areas and provide training and technical assistance in such activities as pruning.

productive function (food production). The mechanisms applied on the island of Vlieland in the Netherlands and two Belgian nature reserves (see box) could serve as good examples of alternative mechanisms. Then, the city government could also send an invitation for public tender to manage, whether partially or entirely, a park or a plant in a park. In such a tender, restrictions (e.g., type of plants, harvest methods) can be taken into account.

To conclude, urban agriculture often advocates the dream of transforming the city into a productive landscape. In Ghent, such ideas challenge the status quo of the city government in the planning and management of public green areas. The city government will have to experiment with innovative governance mechanisms that allow for active involvement of citizens and entrepreneurs. From the case examples we can conclude that the idea of developing products using resources otherwise wasted can be a very valuable starting point. For, ultimately, the vision and strategies of the city government will play a major role in realising the potential of public parks and other green areas to contribute to sustainable city region food systems.

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Public and private harvest of cranberries on Vlieland

Officially, in the nature reserves of the Netherlands it is forbidden by law to remove plants or parts of plants. Yet the harvest of wild cranberries in public areas on Vlieland, an island in the north of the Netherlands, had been tolerated and became increasingly popular among inhabitants, tourists and businesses. This resulted in many local disputes. In response, Staatsbosbeheer, the responsible government agency that manages the property, developed new rules in 2011. In pre-defined areas, people are allowed to manually gather cranberries up to 100 kg. Only inhabitants of the island are allowed to use more intensive harvesting methods, and then only with official permission and with the same volume restriction of 100 kg. Enterprises or individuals that would like to commercialise the product have to be registered as an inhabitant at the municipality of Vlieland. They also need to buy a special permit to harvest and must pay the responsible government agency a percentage on the harvest. For both commercial and private use, the permit also indicates when, and in some cases where, people are allowed to harvest the cranberries.

Two governance mechanisms that integrate productive and environmental functions in a semi-public nature reserve

Gagel (Myrica gale) is a protected species and is a component of heath vegetation. The plant can only be found in two nature reserves in Belgium. One of these, Liereman, is partly owned by the municipality Oud-Turnhout and partly by Natuurpunt, a nature conservation organisation. In order to preserve the plant, the flower buds must be removed yearly. Both owners have established agreements to harvest and process Gagel into a commercialised product.

First, members of Natuurpunt have developed a beer using the Gagel flower buds. This beer has been commercialised by Gageleer, a cooperative company with limited liability. The company is owned by members of Natuurpunt and the profit is used in part to buy new land to develop nature reserves.

Second, for the past several decades the city of Oud-Turnhout has already been issuing an invitation for public tender for yearly picking the flower buds of Gagel in Liereman, the nature reserve that is open to public access (visitors must use the walking trails). With this history as a basis, the municipality established a formal five-year agreement with a Dutch flower company. This company is allowed to harvest the flower buds and use them in flower arrangements to be sold by the company.



Research Priorities for Future Food Systems: A sustainable food systems perspective from Ontario, Canada

Alison Blay-Palmer
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Local apples. Photo by Alison Blay-Palmer

Through direct, on-going engagement with their food communities, researchers have the potential to be grounded in the realities of their food systems. This more holistic understanding challenges researchers to find paths for food system transformation – so that their work is not only grounded in practice, but is also mindful of the institutions and structures that frame, and often confine, food systems. We suggest that research on sustainable food systems can be clustered under three broad key themes including the need for: 1) integration across multiple sectors, disciplines and jurisdictions; 2) tensions and compromises related to the scaling up and scaling out of sustainable food systems; and 3) appropriate governance structures and institutions. These key themes are the focus of regional research agendas developed in dialogue with food communities in Ontario.

Key research themes

It is increasingly important to explore different models and community visions of **integrated** food systems. A key consideration for sustainability is an appropriate mix and balance between social, environmental and economic considerations. Food can be a vehicle for empowerment and social

justice, an opportunity to create spaces for developing community relationships, a determinant of health and dignity, as well as a way to strengthen the local economy. Despite synergistic potentials, however, research still tends to focus on economic development, food access, environmental stewardship, or food and health separately. More deliberate work is needed that amplifies collaboration, for example connecting the health and agricultural departments of local governments to link production and consumption. Also the role of jurisdictional and political boundaries needs rethinking, especially where bioregional and political borders are at odds.

The **scale dimension** represents both the intensity and the extent of impacts, ranging from micro- to macro-size projects, which may be enhanced through “scaling out” and “scaling up”. “Scaling out”, whereby a project or organisation is grown and/or replicated so that it serves more people over a larger area, or “scaling up” by growing individual projects so that they achieve critical mass to provide a service to all people or to bring about institutional change, are key mechanisms to increase impact. Both of these need better understanding. For example, does scaling up equate with shifting the alternative to the mainstream? And can scaling out and up occur in ways that maintain the focus on place and integrating health, environment, social justice, and economics?

Also the issue of **governance** requires consideration. Here, scale and subsidiarity merge as we tackle questions of appropriate intervention points from the local to the global. This topic intersects with questions of power, class and social justice. The role of the state as both an enabler and a barrier

to community food initiatives, as well as related questions of private versus public standards and regulations, need to be examined through comparative work. Further research with marginalised communities, including indigenous and racialised groups, women, and, increasingly, youth, is essential to understand the specificities of appropriate (self-) governance mechanisms.

Future research priorities also need to consider how it is carried out. Comparative research, working directly with community organisations to co-create and apply shared research tools and engage in common assessment projects, offers ways to develop more connected research. More extensive use of methods like concept maps, participatory action research, life-cycle analysis and tracking urban/rural metabolic flows can help to develop and answer future research questions in more holistic ways. Also, future research needs to build on opportunities emerging from more integrated, multidisciplinary approaches.

The Nourishing Communities Research project

In the Nourishing Communities project research topics are being explored and approaches developed through the embedded connections of the research team with our communities of food (see also <http://nourishingcommunities.ca>). This research draws on the three broad themes of integration, scale, and governance identified in the previous section, and research goals and processes are shared with our food communities.

This approach of the Nourishing Communities research project builds on a strong, embedded tradition of community-engaged scholarship. The three themes described above ground our current research, which aims to contribute to achieving more sustainable food systems that are not focused solely on maximising profits. Our researchers work directly with the groups who are trying to make the transition, helping them to figure out what it might look like and how to deal with their current daily challenges. Our work in the Nourishing Communities project builds on the activist/academic tradition established in the 1980s and 90s by the likes of Deb Barndt, Harriet Friedmann, Musafa Koc, Rod MacRae, Luc Mougeot, Joe Nasr, Wayne Roberts and Gerda Wekerle. These individuals laid strong connections with some of the most progressive food activist groups in the world (e.g., FoodShare and the Toronto Food Policy Council). They established a tradition of engaged scholarship that is now the bedrock for our work. It is important to recognise these roots as they inform our work going forward.

As part of this tradition, and consistent with much of food systems scholarship elsewhere, all the scholars involved in the Nourishing Communities research are deeply embedded in their respective communities. This means that our research is based on two-way communication as it is guided by the reality of day-to-day life and the intersecting demands of our work and communities. Current research topics emerged from on-going conversations and collaborations with community partners through regular consultation, participatory action research, workshops and focus groups.

The research crosses urban-rural perspectives and tends to focus on small- to medium-scale organisations. It is organised into **regional research nodes**, each advised by advisory committees composed of farmers, processors and distributors, economic advisors, academics, and representatives of farm organisations, non-profit food groups, and local governments.

While each region has identified research directions based on community priorities and researcher expertise, we also pursue opportunities for comparative work. A provincial advisory committee overlooks and ensures a coherent and complementary approach as well as inter-regional collaboration and tool-sharing. In the following, different research priorities developed by regional research nodes are illustrated.

Regional research priorities

The northern Ontario research node of Nourishing Communities focuses on innovative models for financing community food-related infrastructure, particularly those operating at small and medium scales. These are desperately needed in northern Ontario, and in the context of pressures from the globalised neoliberal food system they represent a step toward developing more local, resilient, scaled-up food initiatives. The models being explored include social financing through community bonds; providing access to loans and financial coaching for charitable and non-profit sectors; community enterprise support and funding; and crowd sourcing. Community capital-building is another focus whereby businesses and non-profits use moneys that have been allocated for advertising and publicity budgets to sponsor and support community events and projects. Alternatively, infrastructure can be funded through local and regional governments and regional development agencies. Other alternative financing projects studied provide no-interest funding to food producers and processors; co-op “member loans” generated on every dollar of sale; and community-supported agriculture (CSA) arrangements where investments are repaid in product.

The **eastern Ontario** research node of Nourishing Communities focuses on two research topics. The first investigates the intersections between housing insecurity and food. With a focus on vulnerable populations living in social housing, this project explores opportunities for food access that offer fresh food and school supplies in addition to non-perishable food items. It analyses urban food market pilot projects established in seven underserved social housing communities; innovative initiatives aimed at “urban gleaning” (the collection of fruits and vegetables from public land and backyard gardens) and at augmenting the urban foodscape; and new infrastructure initiatives, such as a proposed downtown food hub. In the case of food and housing security, in some neighbourhoods a great amount of community-based effort is focused on food, but with housing prices continuing to rise these food initiatives cannot on their own get at the deeper issue of poverty. On the other hand, however, the research is showing that food and housing initiatives that work in tandem, or food initiatives geared



Photo by Alison Blay-Palmer

toward people in social housing (as one example) can do wonders to build community and tackle issues. This is a lesson in integration, in not seeing food (or food security) issues in isolation, and in understanding the structural causes of both food and housing insecurity.

The **eastern and south-western Ontario** research nodes both identified as research priorities land access for local, sustainable production as well as opportunities to help farmers get access to local, sustainable markets. They seek to broaden the local food lens beyond niche, high-end products to ensure it is accessible to all, and therefore concentrate on initiatives that seek to make the link between food access for all and fair livelihoods for farmers. We have been able to identify many examples of land access models as working projects, each with its own emphasis. These include community farms that offer educational opportunities; conservation and land trust properties as land protection strategies; opportunities for sharing land, land-barter, and joint ownership. Other models offer private, municipal, institutional, or green-belt properties with long-term rental agreements or special arrangements. Mentorship programmes are provided through incubator farms and rent-to-own. Zoning and land-use regulation are key elements for such sustainable local food initiatives. The multitude of promising initiatives point to questions at the intersection of integration, scale and governance, and specifically the need for creating a critical mass capable of affecting the food and agriculture landscape as a whole.

The second shared research area between south-western and eastern Ontario assesses the opportunities for farmers to transition into local food markets. Research focuses on alternatives that support new and immigrant farmers, as well as intergenerational and production-based transitions. These include initiatives that facilitate aggregation of

produce from regional farms, as well as distribution, processing, and retailing alternatives that open new markets. Approaches emerging in this area include regional and mid-scale distribution, regional and mid-scale aggregation and processing, and an on-going stream of new “food hubs” that includes multi-use processing facilities for value-added food producers, and accessible retailers. Where direct links do not exist between farmers and consumers, certification and transparency are key dimensions of these new systems.

The **south-western Ontario** research node is engaged in three further research topics related to the governance and scaling up/out of initiatives. The first looks for ways to support sustainable future farm perspectives in those sectors that are supply managed (i.e., dairy and poultry in Canadian farming) and that allow for both greater flexibility and inclusion. Proposed solutions related to supply management include for example on-farm micro-dairies offering direct selling and alternative marketing strategies suited to many family-scale farms. Also, several initiatives are advocating for flexible or increased production quota exemptions that would allow farmers to engage in more direct sales. The second research topic explores flexible and scale-appropriate regulation, including that of provincial slaughterhouses, municipal property tax, tax codes, and planning designations. The third research topic investigates alternative approaches to and models for the aggregation, processing, and distribution of locally produced food that specifically address accessibility in institutional environments. Case studies of sustainability strategies of food-service procurers provide important guidance for negotiating space for local and sustainable products within institutions.

A place-based research agenda

The outlined regional research agendas for Ontario illustrate how on-going efforts to transform food systems are examined through the lens of three key research themes, looking for spaces where integration is or could be happening, where scaling up and scaling out are or could be taking place, and where new modes of food system governance are emerging, as well as how these could be improved. In looking at the food system through these lenses, also interrogated are possibilities of new social, political, and economic relationships in the larger domains of sustainability, social justice, and transformation. Thus, working with a place-based research agenda in our food communities in Ontario is combined with efforts to engage in international, comparative projects and collaborative research work with partners around the globe.

Note

This article is based on a journal commentary published by Blay-Palmer, A. et al. in 2013, with permission of the *Journal of Agriculture, Food Systems, and Community Development (JAFSCD)*. Readers are encouraged to see as well the original commentary at <http://www.agdevjournal.com/volume-3-issue-4/379-sustainable-food-systems-perspective-commentary.html?catid=141%3Aresearch-commentaries>



Examining Food Sources in the City of Tamale, Ghana

Hanna Karg
Edmund K. Akoto-Danso
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Recording food flows at roads in collaboration with the Ghana Police. Photo by H. Karg, E. K. Akoto-Danso

This empirical study examines food sources and their quantitative contribution to the city of Tamale, Ghana. The results contribute to an understanding of the urban food system, and evoke questions relating to the standardised measurement and evaluation of urban food system resilience across geographical contexts.

Introduction

The growing urban demand for food and changing diets are two of the main factors for changing urban food systems as well as underlying production and distribution systems. Short food supply chains have been advocated in recent years to meet urban food needs while minimising negative environmental effects (Edwards-Jones et al., 2008). This is opportune, as data from supermarkets show that the average (mostly processed) food item travels, by air or otherwise, quite a long way before reaching the shelf: in New York, for example, 2000 km and in Accra, 3700 km (Drechsel et al., 2007).

In spite of the growing attention paid to “local” or “regional” food in research and development, there are only very few empirical studies (e.g., Drechsel et al., 2007) that systematically analyse the actual contribution of local and regional food supplying urban markets in a standardised manner. One issue that makes comparative assessments challenging is the lack of a consistent definition for the geographic extent of “local” or “regional”.

The aims of this ongoing study under the UrbanFoodPlus

project (www.urbanfoodplus.org) are to quantify and map food flows supplying urban populations across different seasons in order to understand the reliance of urban centres on different food sources. Study areas are the cities of Tamale, Ghana and Ouagadougou, Burkina Faso, both characterised by high urban growth rates and a high incidence of food insecurity. Although data collection will extend over two years, preliminary results are available for Tamale (for the peak season 2013 and lean season 2014) which allow us to start the discussion on how standardised research tools can contribute to an assessment of urban resilience in view of different food supply chains.

Methods

We collected data primarily on roads and at markets. Unprocessed food flows were recorded for all vehicles entering and leaving the city on all main roads in Tamale. The market survey took place at selected markets within and outside the city; this allowed the capture of urban production and stocks. The main data collected at both markets and at the roadside were (1) kind of foodstuff, (2) foodstuff quantity, and (3) foodstuff source and/or destination.

Flows were recorded for a period of six days, corresponding to the periodic market system according to which market days fall on every sixth day. This means that every six days, farmers have the opportunity to market their produce at the closest village or town from where products leave to the next bigger market (e.g., Tamale). Daily, five days in a row, goods leave for Tamale from one of the five immediate village markets. On the sixth day, when market day takes place in Tamale, the traded volume and food-supplying area increases beyond the aforementioned village markets (see Figure 1).

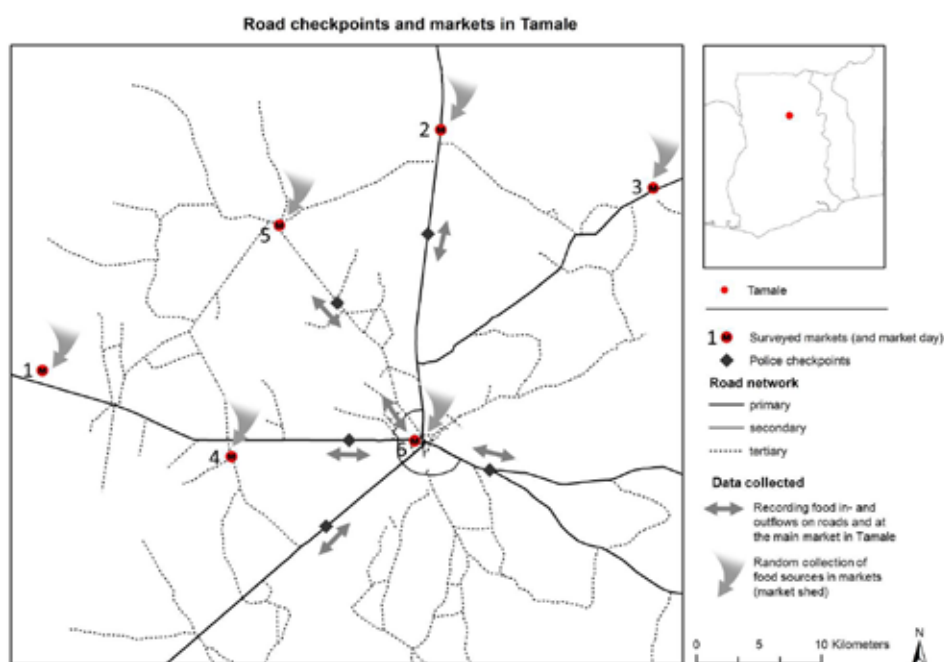


Figure 1: Points of data collection in and around Tamale, Ghana (own draft)

The road survey was carried out in collaboration with the police at existing road checkpoints and with the help of enumerators. This ensured nearly 100 % coverage, with the three major roads covered for 24 hours, and the two minor roads covered for 12 hours (see Figure 1).

The market survey consists of two major components:

1. Food in- and outflows that were recorded at the main wholesale market in Tamale (at the entrance and exit) for 24 hours for the entire survey period of six days, and
2. A so-called market shed study for which, on market days, traded food items and their sources were recorded for all markets in Tamale as well as for the five main village markets using a random systematic sampling (every third trader).

The road and market studies complement each other with due efforts to avoid double counting. The whole survey is being carried out during the peak (end of the rainy season) and lean season (end of the dry season) for two consecutive years. In order to account for temporal changes at a finer resolution, the market shed study is being repeated on a monthly basis in the markets in Tamale.

Location of source and destination was captured for all flows during data entry. The geo-referenced food sources allow for analysis of the data at different spatial scales and for easy adaptation to any definition of “regional” or “local”, “urban” or “periurban” which will be required for a standardised comparison of different city region food systems.

Data can further be analysed according to foodstuff and/or season. The translation into standardised units is based on manual weighing of crops and the volume measurement of different units, such as sacks or basins. One of the possible outputs is a so-called foodshed at different scales, from a village market shed including the rural small-scale farmers marketing their surplus, to an urban foodshed, including

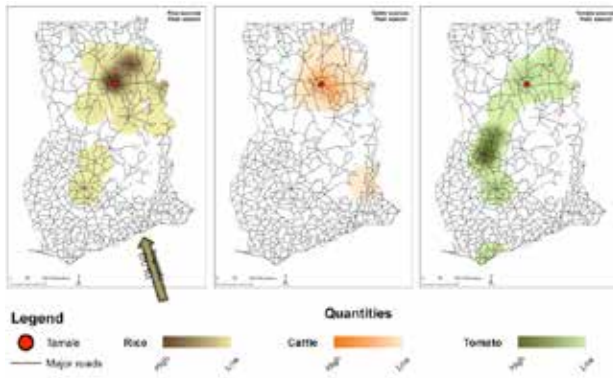
marketed produce from urban and periurban, regional, national and international sources.

Preliminary results

In terms of weight, staple crops such as rice, maize and yam dominate the overall food inflow to Tamale, in particular during the peak season which is the harvesting time for most staple crops. On average, most staple crops come from within an average distance of 60–80 km. However, these are also common in urban backyard gardens, contributing 10 % (maize) to 15 % (rice) to the urban food supply (Drechsel & Keraita, 2014). The function of Tamale as a trade hub becomes evident given the large amounts of outflowing staple crops, in particular maize and soybeans. Rice is the only staple crop imported large-scale and produced beyond African borders. Tomatoes are the major vegetable in both seasons, and in terms of quantity the supply is relatively constant. During the peak season, the majority of tomatoes come from within the country, in particular around Techiman (Figure 2). During the lean season, nearly the entire supply (98 %) is imported from Burkina Faso because the quality of irrigated tomatoes from Burkina is perceived to be better. Even though consumption of fresh tomatoes is relatively high compared to other vegetables, imported tomato paste increasingly serves as a substitute for fresh tomatoes (FAO, 2006).

The only other imported vegetables are onions produced at scale in Niger and added to the onion supply from Bawku in the Upper East Region in Ghana. Even though tomatoes and onions account for a large share of the incoming vegetable supply, “lighter” vegetables such as hot peppers produced within a distance of 50 km and leafy vegetables mostly produced in irrigated urban agriculture also contribute to the marketed urban vegetable supply, though these are not adequately reflected in the weight-based calculation.

The majority of fruits (orange, papaya, banana) and selected vegetables (cabbage, avocado) come from central Ghana



Recording food flows at roads in collaboration with the Ghana Police. Photo by H. Karg, E. K. Akoto-Danso

around Techiman, Kumasi and Kintampo. Most fruits and some vegetables are available only seasonally (orange, watermelon, mango, avocado) but then contribute considerably to the urban supply in terms of fresh weight due to their high water content.

For livestock, seasonal differences can also be observed. In the dry season, when farming activity is low, farmers engage in livestock trading and more meat is consumed in the city. Livestock is usually slaughtered at the location of consumption and comes from within the region; only frozen chicken meat is imported at large scale, which has resulted in a decline of the national chicken industry (FAO, 2014).

These results only include foodstuffs entering official marketing channels. Backyard gardening is common in Tamale during the rainy season and contributes to a household's food needs. Studies done in Kumasi and Accra suggest that households produce up to 10% of their total food needs themselves (Drechsel and Keraita, 2014). Therefore, the presented results should be considered a rather conservative estimate of (marketed) urban food sources.

Applicability of methodology to other settings

The study design was applied in nearly the same manner to Ouagadougou, Burkina Faso. Due to the decentralised market system, the market study had to take place in all 65 urban markets, and due to the role of Ouagadougou as the capital city, supplying village markets were not considered specifically as part of the market study but were captured on the road. Instead, other entry points such as the railway and the airport were included (for secondary data acquisition). The road survey was conducted in a similar manner at the seven roads leading to the city – in collaboration with the tollbooth agency. As shown in similar surveys (Drechsel et al., 2007), we think that this methodology can be extended to other cities in the developing world to map foodsheds and to quantify the contributions of different food sources to urban food security. However, strong local partnerships, for example with the police to take advantage of common control stations, will be essential.

Conclusion

Summarising Tamale's food supply, the majority of unprocessed staple crops is produced in the rural hinterland and channelled through village markets to the city, while leafy vegetables are produced during the dry season in irrigated

urban and periurban agriculture. Some vegetables and fruits are sourced from mainly the central part of Ghana, while only a relatively small fraction of food crops is imported (tomatoes and onions from other West-African countries and rice from outside Africa).

To understand the contribution of the analysed food flows for urban food and nutritional security, it will be necessary to translate the fresh-weight data into indicators such as calories or share of household expenditures.

Another step required will be to explore immediate and underlying causes for food flows and their deviation across cities and seasons, perhaps due to different diets or coping strategies that traders follow to avoid possible supply bottlenecks.

Thus the value of the analysis will increase with the number of cities to be compared. However, to assess food flows and urban food systems systematically and across contexts, a common understanding of terms such as "local" and "regional" will be necessary. Similarly important will be a standardised analysis tool to compare the sustainability and resilience of urban food systems. These depend as much on biophysical conditions as on market opportunities and limitations, as well as on risk mitigation strategies. All of these factors result in a mix of food sourcing and chain lengths which can support the resilience of the urban food supply system.

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FOODMETRES – Metropolitan food planning connecting the local with the global

Group photo of FOODMETRES project team. Photo by FOODMETRES

FOODMETRES aims to describe, analyse and facilitate the development of short food supply chain (SFSC) innovations in metropolitan regions, including their rural, urban and periurban areas. The research carried out in this project covers questions of food production, processing and logistics; its focus is sustainable and resource-efficient solutions which are socially and ecologically embedded. Prior to entering into dialogue with relevant stakeholders from farming, food processing, fresh chain management, retailing, consumption, planning and governance, FOODMETRES gained the necessary technical and institutional insights by studying six metropolitan regions in Europe and Africa, as described in the following article by Pintar et al. (page 45).

Tools used

Central to the FOODMETRES approach is the development of a set of complementary tools:

- *Innovation storylines* that link spatial and functional characteristics of the food chain with different innovation domains and performance indicators;
- a typology for short food supply chains (SFSCs) that serves as a reference for running qualitative *Sustainability Impact Assessments (SIA)* along socio-economic and environmental criteria, tested for further application during interactive Knowledge Brokerage (KB) workshops;
- *Metropolitan Area Profiles and Scenarios* on the basis of European food demand and supply data, specified for the case study regions (see Pintar et al. in this issue);
- a *European Metropolitan Footprint Tool (MFT)*, used as well in the interactive KB-workshops in each city region, that allows land allocation for 13 different food groups on the basis of zoning rules around urban cores; and
- *Knowledge Brokerage (KB)* tools for stakeholder interaction in support of food chain innovation both during regional workshops and by means of an internet-based KB Platform.

By offering tools for both bottom-up processes on the basis of innovation storylines as well as European data-driven top-down tools such as the food demand-supply scenarios, the impact assessment and footprint tools, FOODMETRES intends to bridge the gap between the international dimensions of food policy, trade and consumption on the one hand, and the regional reality of local actors and consumers on the other.

Table 1: Typology of generic supply chain management redesign principles (SCM-RP)

SCM concept element	SCM redesign principle
Managed system	<ul style="list-style-type: none"> Redesign the roles and processes in the supply chain
Managing system	<ul style="list-style-type: none"> Reduce customer order lead times Synchronise all logistical processes with the consumer demand process Coordinate logistical decisions
Information system	<ul style="list-style-type: none"> Create information transparency in the supply chain
Organisational structure	<ul style="list-style-type: none"> Jointly define objectives and performance indicators for the entire supply chain

Innovation domains and storylines

Generally in the agro-food system, technological innovation is still considered the main driver for creating a competitive business advantage, rather than focussing on forms of social, economic and environmental innovation. Building on the work by Avermaete et al. (2003) we see added value in incorporating these innovation domains in an integrated research approach which we call *system innovation* (see Fig. 1).

Drawing on Van der Vorst and Beulens (2002), FOODMETRES uses a list of redesign strategies for attaining more sustainable supply chain objectives and addressing the various system dimensions of food chains from a business perspective (see Table 1).

Innovation storylines focus on innovation domain(s) and redesign principles that are relevant to regional stakeholders (mainly entrepreneurs) for developing more sustainable food chains. Beyond *product* innovations, these may emphasise *process* innovation such as the use of alternative energy sources or different forms of logistical arrangements. They could also target social innovation by involving the consumers at an early stage of the food chain – e.g., during the harvesting of food, or in governance innovation integrating new stakeholders into local food planning strategies. The storylines follow a pre-designed script, to allow for comparison across different commodities on a set of agreed-upon indicators. Scenarios are used to describe possible innovations and development pathways. In the different case studies, we selected commodity groups such as dairy products, potatoes, fruit and vegetables. Related performance indicators included for example: Level of organisation in the region; Kg N and P from regional land (regional cycles) and Kg feed concentrate imported to the region.

Sustainability Impact Assessment

Sustainability Impact Assessment (SIA) has become an obligatory requirement for all EU policies as well as for much national legislation, e.g., as *ex ante* assessments prior to policy implementation. With its objective of avoiding or minimising negative effects as a result of policies and decision-making, SIA has also developed relevance in the arena of food and food supply. In FOODMETRES, SIA is carried out by

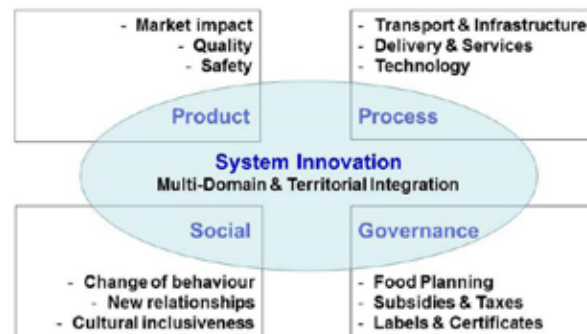


Fig. 1: Innovation domains as put forward by FOODMETRES

applying an assessment framework consisting of a food-oriented set of impact areas which are understood as wider impact and policy fields rather than narrow indicators. Each impact area can be correlated on the one hand to set innovation goals for SFSCs, and on the other hand to political agenda setting towards meeting societal challenges.

FOODMETRES developed its impact areas with the aim of integrating three sustainability dimensions: (i) environment, (ii) economy and (ii) society. Examples of impact indicators in these different areas – as outlined in Table 2 – are food-miles (transport distance, see 1.4) for the environmental impact area, number of jobs along the food chain as an economic impact indicator (see 2.1), and the occurrence of pathogens along the food chain under the food safety domain (3.1). We consider the list of food chain impact areas (see Table 2) to be one of the key outputs of FOODMETRES, as it fills an important gap in this emerging policy field.

The SIA were conducted in a participatory manner, based on judgements by both international experts and regional stakeholders, by online survey and in case study workshops with practitioners. They compared impact areas among a consistent set of SFSC types which include food supply systems that are localised, alternative and social-innovation driven as well as efficiency-oriented and based on sustainable intensification.

The typology developed for the FOODMETRES food chains takes into consideration the fact that short food chains are embedded in a territorial and social context; the typology thus puts the consumer-producer relationship up front. Most types also relate to the different spatial dimensions (local, metropolitan and global) as well as different commodity groups. Preliminary results of the SIA reveal distinct differences between the expert and practitioner perspectives as well as between the different case study sites. These differences highlight the importance of regional situation-adjusted strategies and solutions to SFSC innovation.

Compared to conventional, long food supply chains, all SFSC-types show positive contributions to the various impact fields. Locally, however, depending on the impact and policy

Table 2: Overview of food chain sustainability impact areas

1	Environment
1.1	Eco-efficiency in abiotic resource use (land/soil, water, nutrients) Each food chain is connected with certain farming or gardening systems that may use abiotic resources more efficiently and provide a good input-output relation under given regional conditions.
1.2	Provision of ecological habitats and (agro-)biodiversity Each food chain type is connected with farming practices that may enhance the provision of ecological habitats (e.g., hedges, trees), boost the cultivation of a wider range of crops and livestock (including breeding of traditional or rare species) and increase (agro-)biodiversity.
1.3	Animal protection and welfare Each food chain type is connected with a farming system that may result in different conditions for livestock, animal diseases and ethical considerations.
1.4	Reduction of transportation distance Each food chain type may be connected with a shorter transportation distance from place of production to place of consumption ("reducing food miles").
1.5	Reduction of packaging Each food chain type may be connected with the reduction of the amount of packaging along the whole chain from place of production to place of consumption.
2	Economy
2.1	Employment along the food chain Each food chain type may create new paid jobs (both full- and part-time) within the metropolitan region.
2.2	Income and profitability Each food chain type may generate income and surplus for the actors along the value chain that can be reinvested and used to support the long-term economic viability of the food producers.
2.3	Rural viability and competitiveness Each food chain type may be connected with regional multiplier effects through, for example, regional value-added, income and employment-generated tax revenues.
2.4	Transportation efficiency Each food chain type may be connected with an efficient mode of transport, e.g., adequate vehicles, capacity utilisation, reducing number of travel legs and cutting down on drives without a load.
2.5	Reduction of food loss and waste along the food chain from producer to households Each food chain type may support the reduction of food waste and harvest losses at the production stage as well as along all other stages of the food chain, including consumption at home or out of the home (e.g., at restaurants).
3	Society/culture
3.1	Food safety and human health Each food chain type may result in the absence of pathogens and pollution in the food. Food complies with legal standards regarding microbiological, chemical or physical hazards.
3.2	Food quality (freshness, taste and nutritional value) Each food chain type may result in the provision of food which is fresh and tasty and of good nutritional value.
3.3	Viability of food traditions and culture Each food chain type may result in the increased preservation of cultural distinctiveness and local food, including seasonal variation and local food traditions. This implies knowledge regarding its preparation and cultural role (including religious, ethnic or spiritual purposes).
3.4	Transparency and traceability Each food chain type may result in the increase of transparency and traceability. Transparency refers to information for the consumer about the way the food is grown and distributed through direct consumer-producer relations based on trust and through the use of labelling schemes (e.g., regional & fair, PDO, PGI, organic). Traceability refers to the availability of information at each stage of the supply chain (e.g., tracking of produce with smart codes).
3.5	Food security (availability and accessibility) Each food chain type may result in an increase of food security: that all people, at all times, have physical, social and economic access to sufficient food.

area of interest, it would be necessary to apply specific and different SFSC types. In this respect, the developed SFSC typology also serves as a good communication tool. It can be expected that, in the future, the typology will be extended to cover further types and aspects of food chains not present in the FOODMETRES project.

Metropolitan Footprint Tool

Complementary to the qualitative impact assessment based on stakeholder input, FOODMETRES also assesses the quantitative dimension of urban food consumption addressing spatial, logistical and resource aspects. FOODMETRES identifies the location, type and amount of agriculturally produc-

tive land in reach of urban centres to supply metropolitan populations with regionally grown food.

For this purpose we developed the Metropolitan Footprint Tool (MFT) that allows the spatial allocation of food groups on the basis of regional demand figures derived from food consumption census data compiled by the European Food Safety Authority. The demand figures derived from this database have been projected against the actual metropolitan land use, making use of Homogenous Soil Mapping Units (HSMU). With the digital Maptable technology (see also the article by Pintar et al.), stakeholders can engage in 'serious gaming' exercises and develop scenarios for increasing the

Table 3: Food Chain Typology

1. Urban gardening for self-supply / private consumption (subsistence): food production in the urban setting for own consumption.
<ul style="list-style-type: none"> · Relation type: Consumer as (co-)producer · Subtypes: allotments, community gardens, pick-your-own gardens (offered by a farmer).
2. Urban gardening for commercial purposes: profit-oriented food production in the urban setting.
<ul style="list-style-type: none"> · Relation type: business-to-business.
3. Consumer-producer partnerships/cooperatives: network or association of individual consumers who have decided to support one or more local farms and/or food producers/processors.
<ul style="list-style-type: none"> · Relation type: Consumer-producer partnerships/cooperatives · Subtypes: Community Supported Agriculture (CSA), Ethical Purchasing Groups (EPG)¹, Solidarity Purchasing Groups (SPG), and food co-ops.
4. Direct sales/marketing on-farm to the private consumer: farmers sell their products directly on their farm.
<ul style="list-style-type: none"> · Relation type: business-to-consumer. · Subtypes: farm shops and stands, pick-your-own.
5. Direct sales/marketing off-farm to the private consumer: direct selling of products from a farm on the market in the urban area.
<ul style="list-style-type: none"> · Relation type: business-to-consumer. · Subtypes: farmers and weekly markets, market halls, home deliver.
6. Sale to regional enterprises, such as those in retail or hospitality (e.g., restaurants, hotels, pubs), which provide food for the urban population.
<ul style="list-style-type: none"> · Relation type: business-to-business
7. Sale to public procurement and public catering: preparation and delivery of meals for collective consumers in the urban area. Include intermediaries such as wholesale.
<ul style="list-style-type: none"> · Relation type: business-to-business
8. AgroParks / Metropolitan Food Clusters (MFC): "spatially clustered agro food systems in which several primary producers and suppliers, processors and/or distributors cooperate to achieve high-quality sustainable agro-food production...". MFC are oriented towards the markets in the Metropolitan Region providing food for the urban population, and also to the world market.
<ul style="list-style-type: none"> · Relation type: business-to-business

supply with regional food for 8 food groups on the basis of the urban consumption needs. During regional workshops, stakeholders can suggest where different crop types can be produced for urban consumers. Building upon the classical market-centred Von Thünen (1826) model, but translating it into the system environment of today's agro-food-sector and spatial planning strategies, the following spatial areas are identified: (1) urban core area, (2) green buffer & fingers, (3) metropolitan food production, and (4) transition zone.

For Rotterdam metropolitan region, and taking into account the urban demand for recreation (0.2 ha/per person; see Goossen, 2014) and food consumption (Sali et al. 2015), the metropolitan food production zone comprises a total of 48,000 ha – agricultural hectares potentially available to mainly satisfy the non-meat consumption needs of the 1.2 million inhabitants of the Rotterdam City Region. Land cover such as urban areas, water bodies and nature conservation areas are excluded from this food production zone.

Besides the map, stakeholders also receive statistical information in which – according to the demand figures – crop types are over-represented or underrepresented in the current land-use scheme. Together with researchers, stake-

holders can then, through direct operations on the digital Maptable, make land-use change proposals for better balancing supply and demand in the respective metropolitan production region and – if necessary – also beyond, in the transition zone.

Conclusions

By offering tools for bottom-up processes as well as European data-driven top-down tools, FOODMETRES intends to bridge the gap between the international dimensions of food policy, trade and consumption on the one hand, and the regional reality of local actors and consumers on the other hand. Three of such tools are introduced in this article. The Innovation Storylines tool can help to structure evidence along innovation domains and hence facilitate exploring potentials of metropolitan SFSC across commodities and across regions. The Sustainability Impact Assessment tool supports the profiling of different food chain types towards innovation goals in terms of impact areas which are specific to food chain innovation. The Metropolitan Footprint tool integrates relevant planning dimensions, for example supply and demand of agricultural productive land and land-use composition, with stakeholder preferences on spatial allocations. Physical tools like the Maptable technology are helpful means to support discussion and decision processes, particularly for scenario building for the integration of multiple land use purposes, zoning and future conceptual designs and delineations. Project results indicate that the tools developed are relevant starting points for structured exchange between regions and stakeholders engaged in SFSC innovation.

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Note

- 1) these are like-minded individuals who join efforts to achieve a certain food quality or price



FOODMETRES – Case studies from North to South

Guerrilla allotment gardens on public land in Ljubljana Trnovo district. Photo by Matja Glavan

Food chains considered to be sustainable are chains that produce food closer to the city, reduce the number of steps in the chain and use natural resources more efficiently. In the FOODMETRES project (see previous article), case studies were undertaken for six metropolitan regions – London, Rotterdam, Berlin, Milan, Ljubljana, and Nairobi – to show interesting practices and lessons for achieving short food supply chains (SFSC) for sustainable metropolises.

London – local food initiatives for food chain innovation on a larger scale

The two examples below illustrate different types of food chain innovation in London (UK). *Crystal Palace Food Market* is a small-scale community, not-for-profit Transition Town project bringing the best quality, locally sourced, low-carbon food into the heart of Crystal Palace. The market supports local producers, small-scale farmers and local growing projects and aims to promote community, encourage local growing and create local employment.

Growing Communities serves the locality as well as the wider metropolitan area through community-led trade. Growing Communities runs an organic fruit and vegetable box scheme, the Stoke Newington Farmer's Market, and organically certified urban market gardens which grow products for sale through the box scheme. They also source food grown for the box schemes in back gardens, on church land and on estates.

The Sustainability Impact Assessment (SIA) performed in London aimed to find out how *stakeholders rank the impacts of different types of short food supply chains (SFSC)*, comparing them to the current baseline scenario in which most of the vegetable supply comes from supermarkets, long food chains and large-scale producers. Specifically, vegetable food supply chains were considered; potential impacts of five different short food supply chains were rated from very negative (-3) to very positive (+3).

The results showed the highest overall impact rating for the short food supply chain “CSA - Community Supported Agriculture”, followed by “Urban gardening for commercial purposes”. The lowest overall rating was for the supply chain “Direct sales on farm to private consumer”.

Economic related impacts generally received low ratings. Comparing the urban SFSC to current mainstream food supply chains, participants estimated low impacts with regard to transport efficiency. “Transport efficiency” also had the lowest overall rating of 0.3 for the “Direct off-farm” supply chain. Another low impact score (0.1) was expected for “Generating employment along the food chain” for the supply chain “Urban gardening (self-supply)” (see Fig. 1). This, however, may not take into consideration that self-supply can also be seen as part-time self-employment rather than just subsistence food provisioning.

Rotterdam – towards more regional dairy products

In the Rotterdam area (The Netherlands) the project *Kringloopboeren in Midden Delfland* seeks to strengthen the capacities of farmers as the main stewards of the typical Dutch landscape. More than 30 dairy farmers are participating in the project. To guarantee a sustainable income for these farmers while at the same time preserving the typical landscape requires innovation in the chain. Farmers are already diversifying their activities, for example, by producing their own cheese or butter.

De Delflandse kluit is a historical name, used for the butter produced in the Midden Delfland area. Production of 1 kg of butter requires 20 kg of milk. This implies that even with small consumer demand, it is possible to process a large quantity of milk from the farms. In the Midden Delfland area there are roughly one million consumers; even if only 5 % of them buy one single 250-gram package of butter each year, this adds up to 12,500 kilograms of butter requiring 250,000 kilograms of milk: half the annual milk production of an average Midden Delfland farmer.

During the Midden Delfland dairy product workshop, the Dutch project partner Alterra supported knowledge brokerage by showing data on the region on a digital Maptable. The Maptable offers a touch-sensitive large computer screen

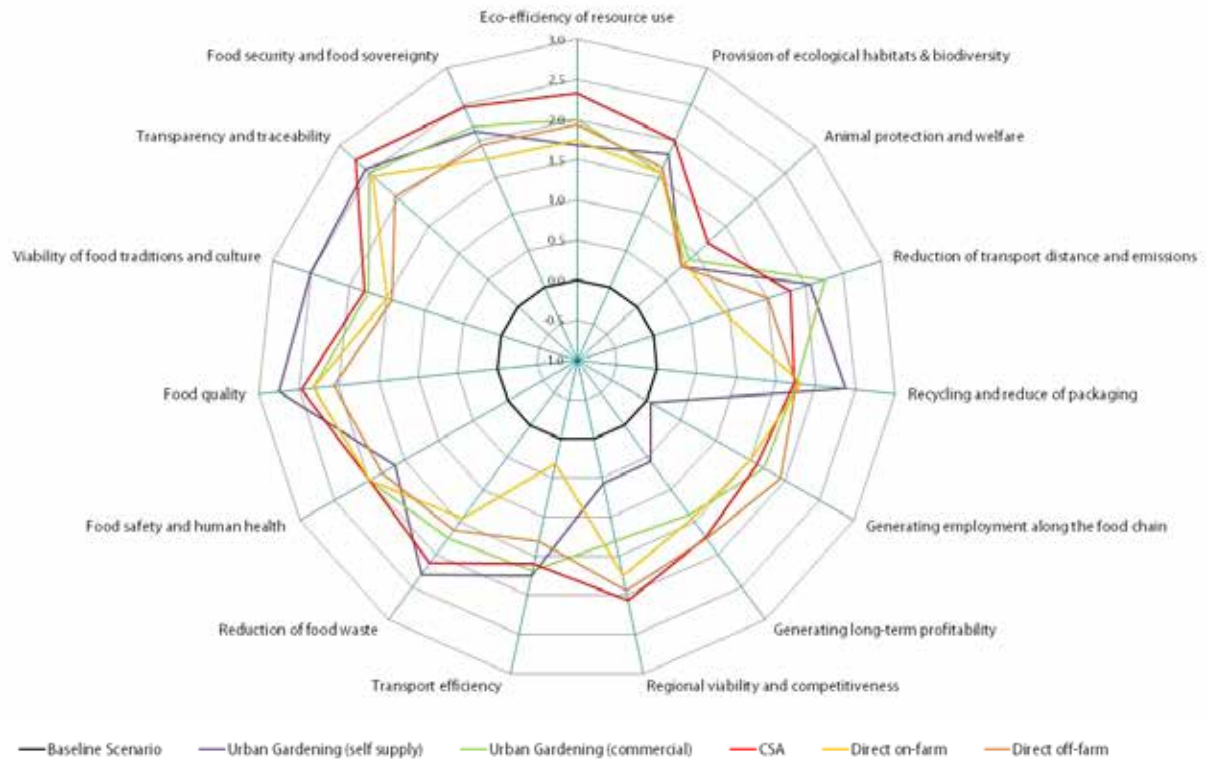


fig.1 Estimation of the environmental impacts by participants of the London workshop for vegetable supply chains (N=17).

that allows users to draw with their fingers or with the aid of a pen. The drawings are made directly on top of georeferenced maps. In the workshop, stakeholders were invited to draw the most convenient locations for the new production chain.

Berlin – organic food production

Berlin-Brandenburg (Germany) is characterised by rural agricultural areas in the direct vicinity of the metropolitan centre. The green and creative image of the region has given rise to a large number of innovative urban agriculture and regional organic food provision, marketing, and food strategies.

Five organic SFSC types were selected for the sustainability impact assessment: (1) urban gardening for self-supply, (2) pick-your-own gardens, (3) community supported agriculture (CSA), (4) regional organic product sold on a Berlin weekly market, (5) retail (global organic chain, supermarket). Regarding their environmental impacts, CSA and pick-your-own gardens were rated highest. Most of the short supply chains are estimated to perform better than the baseline, except urban gardening (self-supply) in the impact area of “protection of natural resources and efficient resource use”. This is because it is assumed that urban consumers producing their own food tend to have less expertise and experience than professional farmers and gardeners, and thus apply gardening methods and practices that are less efficient with regard to use of water and nutrients, even in organic production. The economic sustainability profile of the SFSC differs markedly and is positive, as compared to the global chain, except for transportation efficiency.

Regarding social sustainability, impacts of SFSC were generally thought to be positive, except for food security. Stakeholders pointed to the comparably low share of SFSC-derived food to overall urban consumption, and to the strong

seasonal variability in production. Another critical point is food safety in urban gardening, where little is known about heavy metal concentrations in urban soils and food safety in general because production takes place outside formal monitoring.

Milan – food supply and demand in the metropolitan region

The metropolitan area of Milan (Italy) is one of the most populated areas in Europe. Its high demand for food is currently satisfied mainly by global food supply chains.

In Milan, FOODMETRES produced three scenarios to support policymakers in improving the sustainability of the agro-food system.

The baseline scenario (scenario 0) represents the current agro-food system, in terms of local area of cultivated crops and number of livestock. This scenario only partially meets the food demand and generates an economic production value of about EUR 2.5 billion. The strong presence of livestock requires a large amount of fodder, of which only 30% is locally supplied. Scenario 1 assumes that all fodder needed is produced locally. Even if the entire agricultural area were to be devoted to producing forage, this production could not feed all the dairy cows and the broilers currently bred: an additional 55,800 hectares would be needed in order to provide for all the animal feeding requirements. Moreover, this scenario would lead to a decrease in the production value by EUR 500 million.

The second scenario aims to simulate production oriented to a vegetarian diet and replacement of meat proteins with the same amount of legumes, milk and eggs. Increased production of these staple foods would be possible in terms of land use while maintaining other crops, thus corresponding fairly well with the entire food demand. However, the lower income provided by food crops as compared to feed or animal prod-

ucts would largely decrease the economic value generated by 67%.

The analysis shows that different production scenarios impact both economic and environmental performance. For example, a higher degree of self-reliance for feed would lead to lower production variety. Scenario development can thus support decision making by policy makers.

Ljubljana – urban gardening and agropark food hub

A traditional form of food production in Slovenia is plot gardening. More than 192 self-supply gardeners all over Ljubljana Metropolitan region were asked to estimate their yearly production costs. By multiplying yields (1.9 kg/m²) of the five most common harvested vegetables by the average retail vegetable price, revenues were estimated (EUR 4/m²). Deducting the production cost (EUR 0.5/m²) from revenue yields the average gross margin for gardening production: EUR 3.5/m². The economic impact of urban gardening (45.89 ha) on the vegetable supply chain in the city of Ljubljana is thus calculated at a gross margin of EUR 1,576,524. Another SFSC is set up by the SME Geaprodukt, a firm that has a 12% share in the distribution of vegetable and fruits in Slovenia. Together with the SME ProContus, they aim to develop an agropark food hub for local vegetable and fruit producers. This partnership offers local producers (i.e., farmers and home gardeners who sell surpluses for commercial purposes) gratis market space to sell their products directly to customers. Afterwards they can sell remaining leftover products to Geaprodukt.

According to the Slovenian experts' estimations, vegetable food chains with direct consumer-producer relations (direct sales on-farm, CSA and direct sales off-farm) have the highest positive sustainability impact. The lowest impacts were expected from metropolitan food clusters (MFC)/AgroParks and public procurement. Negative impacts are attributed to employment and income in the case of urban gardening for self-supply and to the reduction of food waste and loss for MFC/AgroParks and public procurement, the latter being larger scale and long (regional) food chains. Whether this is true would be an interesting question for further investigation.

Nairobi – do SFSC benefit poor consumers?

One hypothesis that stakeholders discussed in Nairobi (Kenya) was: "Short supply chains, including urban agriculture, do not provide a meaningful food-security solution for Nairobi because it is too small scale, and the land used for urban farming may have better urban uses".

Participants felt, however, that less actors in the chain makes food cheaper, and so the shorter the food chain, the better for the poor and middle class, making short chains more desirable. And while it is true that SFSC do crowd out middlemen, such actors are far fewer compared to the consumers of SFSC, the majority of whom are poor. In other words, a food supply chain cuts off a few poor people to benefit many. Furthermore, it is assumed that the shorter the food chain the safer the food will be, especially for informal chains and comparing production to street food vending. In fact, it is partly because of the fear of consuming contaminated vegetables produced within the city that many urban residents and youth groups

tend to take up urban gardening (further shortening the food chain) and/or prefer to purchase vegetables from known sources such as their neighbours.

However, there are reservations about scale and future availability of land for local production. What will happen in 2020, given that Nairobi is growing so fast?

All five vegetable chains assessed by Kenyan experts were rated highest in their social aspects of sustainability. The results show that urban farming for self-supply in Nairobi has quite a low positive economic, but a high social impact. This is because urban farmers in Nairobi do not practice gardening for commercial purposes, but rather for social reasons associated with food quality, safety and health, security and traceability. When there is surplus, however, urban gardeners sell the extra produce for income.

For all chain types, the experts expect positive impacts on sustainability in comparison with the baseline. High positive impacts identified included "food quality" (all chain types except CSA), "food safety" and "food security" as well as "reduction of food waste and loss" (urban gardening self-supply, urban gardening commercial and direct sales off-farm). This was expected, given the transport inefficiencies and multi-actor logistical organisation along the conventional vegetable supply chain that results in spoilage and waste; and also given the large proportion of income spent on food by the urban poor, as well as widespread concerns about the possible use of untreated waste water and sewage for vegetable production in some parts of the city.

Interestingly, urban gardening for self-supply is seen as very efficient in the use of natural resources in Nairobi (as in Ljubljana), whereas the European experts in Germany and London came to a different conclusion. In the particular case of Nairobi this could be explained by the involvement of agricultural extension service personnel who educate urban farmers on the adoption of sustainable farming methodologies including recycling of waste, composting, etc. The Nairobi participants also associate food production in urban areas more strongly with the provision of ecological habitats than do the European participants. This might be the result of a generally more positive impact rating in Nairobi, or of the fact that, in the densely populated Nairobi region, green (production) space is of great value to its inhabitants.

The variety of case studies involved allows valuable insights into the different European and African contexts and the investigation of the regional peculiarities and challenges of the individual metropolitan agro-food systems. The SIA tool supports profiling of different food-chain types towards innovation goals in terms of impact areas which are specific to food-chain innovation. The proof of sustainability benefits through innovation, in addition to the importance of regional situation-adjusted solutions, are important project findings.

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Can Local Food Production Reduce Food Imports and Transport? The case of lettuce in Rosario, Argentina

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Lettuce production in the horticultural garden of Parque Huerta La Tablada. Photo by Silvio Moriconi and Javier Alejandro Couretot

In its 2013 report *The Physical Science Basis*, the United Nations Intergovernmental Panel on Climate Change (IPCC, 2013) notes that the mean global temperature increased by 0.9 °C from the time instruments registered temperature in 1880 to 2012. The report also states that the contribution of anthropogenic (human) to global warming is estimated to be 98% of the total impact, and the remaining 2% due to natural causes (a small increase in sun intensity).

Food miles and climate change

Urbanisation and climate change are closely linked. Carbon dioxide (CO₂) and other greenhouse gasses (GHG) are emitted mainly in urban and industrial areas. Cities, and their sheer number of inhabitants, are at the same time also directly and indirectly affected by climate change. According to the 2014 fifth IPCC report, key issues include rising temperatures, increasing rainfall, flooding, and urban food insecurity.

Cities have an important role to play in climate change mitigation and adaptation, while at the same time they need to

ensure their growing populations adequate access to basic urban services such as water, food and energy. A focus on international trade, the production of export crops and increasing dependency on food imports, however, have reduced local capacity to feed the local population and increased vulnerability to food insecurity, specifically affecting the urban poor (Baker, 2008, Prain and De Zeeuw, 2010). There is also increasing doubt regarding the sustainability of intensive conventional agriculture and global distribution systems because of the associated loss of agro-biodiversity, erosion, water pollution, high GHG emissions and food waste. Food systems (including production, transportation, distribution and consumption of food) contribute to about 30–40% of global GHG emissions. About a quarter of the GHG emissions of the food system are caused by food losses and food wastes. In this regard, there is a clear need to increase the sustainability of our food systems and investigate opportunities for more localised food systems. Urban and periurban agriculture are forms of more localised production.

This article analyses the role of food transportation in the reduction of the emission of GHG. Food transportation is often expressed as *food miles* or *food kilometres*; these are the distances travelled by food items from farm gate to consumer. They are generally measured in tonne-kilometres, i.e. the distance travelled in kilometres multiplied by the

weight in tonnes for each food item. However, to measure the environmental impact of food kilometres it is necessary to convert them into food vehicle kilometres, i.e. the sum of the distances travelled by each vehicle carrying food (see definition in Watkiss et al., 2005).

Food transportation to the city

The type and amount of food that is transported to a city depends directly on the diet (or food basket) of its inhabitants. In Argentina, as in the Greater Rosario city region of about 1.5 million inhabitants, the main vegetables consumed are, in decreasing order of importance: potato, tomato, lettuce, onion, carrot and squash/pumpkin.

The provision of vegetables to a city originates at various production locations. Some of these sources are in the urban area (urban gardens) or the periurban areas; some sources are regional, national or international, depending on the type of vegetable, the season, and land use and production conditions.

The table below presents the production origin, marketing period, average distance and volume of lettuce transported to Rosario in different periods of the year.

These data and more specific data on the type of transport used make it possible to calculate the amount of energy (fossil fuel) used for vegetable food transport and the corresponding emission of greenhouse gases (such as carbon dioxide, nitric oxide, methane and halocarbons). Energy and GHG emissions reductions can be calculated if it is assumed that all (or part) of the production of lettuce will take place locally (in the city or its periurban region).

*Lettuce (*Lactuca sativa* L.)* was used for this study as it cannot be stored for a long period and thus necessitates frequent transport from production site to the place of consumption, resulting in a large number of trips. In addition, because it cannot be closely packed, its transport requires larger-volume trucks.

The current (2015) local production of lettuce in the horticultural gardens of the city is about 240 tonnes per year; in the periurban region or the horticultural green belt of Greater Rosario (Grasso et al., 2012) it is 3,820 tonnes per year, while the largest quantity of 35,940 tonnes per year is transported from more remote regions (the provinces of Tucumán and Santiago del Estero and Mar del Plata periurban region) located an average distance of 815 km from the city (Table 1). The number of trips is calculated by dividing the total volume of transported lettuce by the average volume capacity of the food trucks. We differentiated two transport distances: a)



Photo by Silvio Moriconi and Javier Alejandro Couretot

from the horticultural gardens in the city and the periurban region, and b) from the distant regions of Tucumán and Santiago del Estero Provinces and Mar del Plata periurban region.

Food miles and related emissions

As shown in Table 1, the total annual volume of lettuce transported to the Greater Rosario Region stands at 40,000 tonnes per year, to which the urban and periurban production region contributes about 10% and distant production regions 90%. Assuming that the transportation does not use refrigeration for food preservation, and assuming that the trucks used have a 10-tonne load capacity and a standard fuel consumption of 0.32 litre of diesel/km at full capacity and of 0.23 litre of diesel/km empty, fuel use for transportation from the urban and periurban region is calculated at 19,000 litres of diesel per year. For distant production this figure is 1,561,200 litres of diesel per year.

Using a conversion factor of 2.92 kg of emitted CO₂^{equivalent} (that includes all GHG) per litre of diesel (Hilbert and Galbusera, 2011), for the urban and periurban production emissions equal only 53 tonnes of CO₂ per year, while emissions for distant transportation stand at 4,304 tonnes of CO₂^{equivalent} per year. If all this distant production could be replaced by local production (possibly using greenhouses supplied with renewable geothermal energy in the autumn-winter period), this last value would be drastically reduced by an amount equivalent to the annual GHG emission associated with 757 Argentinians (http://www.ambiente.gov.ar/archivos/web/UCC/File/030608_metodologia_huella_carbono.pdf).

Table 1. Note: The total weight of the lettuce actually consumed is about 30% lower than the volume brought into the city, due to losses along the chain (Mercado de Concentración de Fisherton, Rosario, Argentina).

Origin	Marketing period	Average distance to Rosario City (km)	Volume of lettuce transported annually to Greater Rosario (tonnes per year)
Tucumán Province	May to September	950	14,000
Santiago del Estero Province	August to October	780	11,500
Mar del Plata periurban region	December to February	710	10,440
Rosario periurban region	December to February	30	3,820
Rosario horticultural gardens	December to February	10	240
Total			40,000

Land-use analysis indicates that the amount of land required for such local production is indeed available and that use of the greenhouses mentioned would be feasible as proposed and tested earlier by Levit, Gaspar and Piacentini (1989).

Conclusions and suggestions

If all the lettuce were produced in the Greater Rosario region instead of in distant production locations, reductions in fuel use and contaminant GHG gas emissions could be as high as 90%.

An even larger reduction in the use of fossil fuel can be achieved if the remaining, local transportation utilises renewable energy sources, or if local transport is carried out, for example, by bicycle. If, in addition, food losses are reduced in the entire supply chain and if organic city waste is used for compost production and fertilisation, total emissions related to production and consumption will be lowered even further.

In order to get a better understanding of the potential of increasing the sustainability of the entire Rosario food system, more research is needed on:

- Calculating food miles associated with other vegetables and non-vegetable (e.g., dairy) food products;
- the increase in energy-use efficiency in the entire production and supply chain;
- applying Life Cycle Analysis taking into account the whole process, from the preparation of land for vegetable culture to waste disposal (and eventually compost production) for the food consumed; and
- the determination of the *food satisfaction demand* (modelling increase in urbanisation and change in consumption patterns for the production and consumption of different types of foods) (Piacentini and Sukkel, 2014).

Local authorities could improve local food production and food security by: a) protecting, zoning and increasing the land area for this activity, b) promoting the consumption of local foods through public information campaigns, and c) supporting the use of low-contaminant (or even zero-contaminant) transport for food transportation.

The Rosario Municipality has already included new areas for periurban agriculture in their city development plan.

“We see the importance of preserving and expanding areas for local food production. The municipality has included a new land use category in our urban development plan being ‘land used for primary production’. We have currently doubled the periurban agricultural protection zone from 400-800 ha.” – Mónica Fein, mayor of Rosario City (CDKN/RUAF Research Review Workshop and Policy Seminar “Review of research data on and policy uptake of urban and periurban agriculture and forestry in climate change and city development strategies”, August 2014, Rosario, Argentina)

In this way, local urban and periurban agriculture can be promoted for the mitigation of climate change as well as to

provide the citizens involved in these activities other opportunities for social development.

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Note

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An Innovative Short Chain in the Netherlands: Willem&Drees

Els Hegger

Willem and Drees. Photo by Willem&Drees

Willem&Drees (W&D) is a grocery wholesaler specifically dedicated to short-chain delivery. W&D started in June 2009 by supplying locally grown vegetables, potatoes and fruits to shops and supermarkets. Currently, W&D supplies supermarkets, catering companies and other out-of-home consumption points throughout the Netherlands with products from selected farmers located as close as possible to the point of sale. The innovative and unique character of W&D is that it offers the mainstream shopper the possibility of buying seasonal products from their own region.

Short-chain delivery is usually bound to logistics outside of the mainstream food business. Box schemes, online shops, organic supermarkets, farmers' markets – all of these are themselves chains not connected to mainstream chains. As this automatically means many consumers do not have access to local produce, W&D developed a way to integrate local food into mainstream logistics. The business is a typical development that fits within current sustainable food trends: W&D serves the hybrid consumers who make an ad-hoc decision about their buying behaviour. The W&D consumer sometimes buys online, sometimes in an organic shop, other times at the market but also at conventional supermarkets. W&D is a child of our time: offering sustain-

able local products to the convenience shopper, making it easy to choose sustainable and local.

At the start in 2009, W&D maintained a strict maximum range of 40 km from farmer to consumer. However, as the business developed its team applied the concept of "locality" in a more dynamic way. Their philosophy is "as near to the

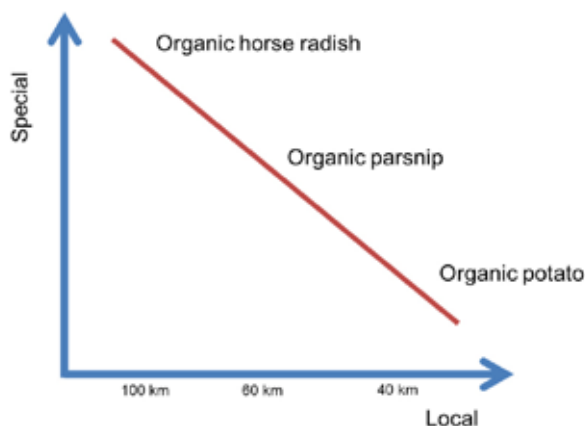
Business model

W&D is a social enterprise financed by private equity. The financiers support the philosophy and business approach of W&D. From the start it has been clear that profit has to be made but not at any cost. Profit is not the core aim of the company; changing our food system is. This creates a different approach to doing business and opens up room for innovation and creativity. Since the start in 2009, W&D has been unable to make any profit. They are, however, doing well and growing exponentially. Increasingly, they are visible in the media in the Netherlands, and a discussion about our food system without at least a quote from Willem or Drees is not taken seriously. W&D is becoming a brand. Once a brand is established, various possibilities open up for further innovation. Who knows...maybe even a W&D outside of the Netherlands?

consumer as possible". W&D developed their own ICT tool to determine the distance of each product in stock to a possible point of sale. The ICT tool compares the postal codes (PC) of the products in stock to the PC of the retailer, then automatically chooses the product with the closest PC. The main reasons for switching from a fixed distance to a more dynamic approach to locality involve sustainability and product range.

The issue of sustainability is germane because keeping to a strict distance can result in food items being transported in half-empty trucks, especially perishable produce that cannot be kept in stock for very long. The W&D product range has expanded dramatically since the company began. Working with a fixed distance works, for example, for potatoes, which are widely available throughout the Netherlands. However, it becomes more difficult in the case of organic horse radish that is only grown in certain parts of the country. In other words, the wider the assortment of W&D with more unique varieties, the more logical and rational it becomes to allow greater travel distances for products. W&D's definition of "local" is expressed in the diagram below. It should be noted that produce never comes from outside the Netherlands: the national borders are also the boundaries for W&D.

W&D started small, from one town in the centre of the Netherlands. It grew slowly, region by region, from the standpoint of both suppliers and delivery. In 2013, W&D began serving the entire country, and in 2014 they grew to include a full assortment in each region. All products travel from their origin to the W&D central distribution centre before being distributed. At farm level the products are packaged, they are stickered at the distribution centre. The sticker contains information about the product origin and the name of the farm, and sometimes a picture of the farmer to further personalise the product. W&D put a great deal of effort into "telling the story of the farmer, of the origin of the product". Each week one farmer is highlighted with a story and/or video on the firm's website. Through various media, W&D tries to minimise the distance between consumer and producer, especially because this is often impossible in physical terms. In the supermarkets W&D has a special area within the fresh fruit and vegetable section. The products are offered in branded wooden crates where possible in order to focus attention on their products. Often consumers are attracted to this natural-looking section and decide to



Farmer

"I am very proud to be part of W&D as a farmer. It is not very profitable for me at the moment, but that's okay. The way W&D gives attention to local products, and to the farmers who produce these products, engenders a feeling of respect. I am once again a person in the chain, not just some anonymous producer. In turn this creates a greater sense of responsibility in me, to achieve and to produce beautiful, unique, tasty vegetables."

try something.

W&D focuses on selling seasonal products. This means that people have access to varieties of vegetables and fruits otherwise not within easy reach, such as rainbow carrots, parsnip, cabbages, special varieties of potatoes or strawberries. Although supermarkets offer the same product range throughout the year, seasonality is largely lost; W&D restores this connection by offering products only in season. Recently, the range of niche products has grown considerably. The company is now offering varieties of the same product (e.g.,

Short chains are all about soft indicators

Drees Peter van den Bosch is one of the two owners of W&D. Together with Willem Treep he is on a mission to change our food system. The road to this mission is sometimes a rough one, with difficult choices to make but also with interesting new insights gained and lessons learned. "I was involved in a project called SUPURBFOOD and I really wanted the researchers to find out for me how we were performing in terms of hard indicators such as CO2 emissions. I wanted scientific proof for what we are doing, to show other people that what Willem and I are telling them is true. The project was a big struggle at times, as we could not find a way to deal with the complexity of the benefits of our local chain. Slowly, I realised that assessing our local chain with the tools of conventional chains is just not fair and that assessment should not be done that way. What we are doing is so much more than reducing emissions or improving product life cycles. We are redefining our food system with all its aspects, including cultural, social, ethical and human characteristics that are not included in assessments or that are indirect results difficult to measure. The project made me realise that it is not about these hard indicators, but rather about soft indicators whose value becomes clear only through telling the story of our company and the story of our farmers."

Jinghe online farm

In China in recent years, a number of serious health scandals have erupted among urban consumers due to many reported incidences with unsafe food. As a response, membership farms in the big cities of that country were started up and have grown rapidly. Consumers feel they can better trust and control the food they eat if they have more information, and if they are in direct contact with the farms producing their food.

Two kinds of models exist for these membership farms: the community supported farm and the online farm. Jinghe is an example of an online farm from which members can order their packet of vegetables.

In 2013, with the support of the local government, Jinghe developed an online virtual platform that functions as an online marketplace. It is run by the Sunlong group which, with its 15 employees, is in charge of the packaging, distribution and website maintenance. The platform is linked to

many cooperatives and other producers responsible for delivering the requested products to the consumers.

Jinghe started by selling only vegetables to their consumers, but is now exploring such other products as fruit, meat, eggs, milk, poultry, grain and oil. People can also buy imported fruits and seasonal vegetables through the expanding system. Through an online tracking system for each product, people can track the products from the fields of origin. Indeed, this ensures that people feel more confident about quality and safety standards being met. Jinghe also organises consumer visits to the food enterprises and farmer cooperatives, to give people more information on the process of farming and food production.

What W&D and Jinghe have in common, although with a different geographical approach, is the aim to inform their consumers about the origin of their food. They also both function as a platform and distribution hub between producers and consumers.

not just red beetroots but six different kinds) and special seasonal bags with different products (e.g., all you need for a winter soup). The impetus for expanding the product range comes from both farmers and from W&D itself. Sometimes farmers send W&D a package of a special variety they grow. On other occasions the W&D team observes that there is room in the market for a certain product (e.g., round courgettes) and they ask one or more farmers to start cultivating them. Farmers experiment with these new varieties or products themselves, W&D does not offer them anything in advance. This typifies the W&D farmer: innovative and looking for another way of growing and doing business rather than anonymous mainstream production.

W&D works with approximately 130 farmers throughout the season, and most of the farmers deliver products to W&D during a certain part of the year (e.g., a cherry farmer supplies only 3 months of the year). None of the farmers supplies exclusively to W&D; neither the farmer nor W&D wants to create such a dependency. The maximum amount W&D buys is approximately 50% – in most cases less than 20% – of a farmer's total production. The number of farmers is expanding less rapidly than the number of customers, and W&D is able to buy more from the growers they already have on their list. Farmers can become W&D farmers when they adhere to certain W&D standards. This does not necessarily include organic growing, though in practice 90% of the produce sold is certified organic. W&D works with a sustainability philosophy that is not aligned with an official certification – rather, it is based on trust and on close cooperation with the farmers. Most are small-scale farmers and share fully the W&D vision and mission; the possibility of working with W&D gives them the opportunity to embody their ideals. W&D farmers are just a touch more innovative and

progressive in their farming techniques and crop choice. W&D does not guarantee the farmer any sales, but they do guarantee a certain price for the farmer's produce that is considerably higher than mainstream. This price is never imposed on the farmers but is always based on a mutual agreement. If a farmer thinks a price is too low, W&D cooperates in finding a price that works for everyone. Interestingly, this works very well, especially since farmers are part of the process. Farmers are given responsibility for the price set, as they are shown what happens if the gap between mainstream and the W&D price is too big. In other words: if the price gap is too large, people will buy less and this means less revenues for the farmer. In general, farmers enjoy this way of working, as they feel appreciated and valued for their expertise.

Another interesting aspect of setting the price is that all farmers know the price the other farmers are getting: there are no secrets. Again this illustrates the W&D philosophy: relationships are based on trust and transparency. As mentioned above, W&D holds no certificate or label, the business works solely on the basis of trust. Clearly, the trust cannot be betrayed and only works with complete transparency. In other words, W&D has found a way to integrate local food into mainstream logistics while possessing the unique features of short chains: trust and transparency.

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Edible Landscape: Food and services from common-land use in the Vigo city region

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City region landscape with Monte and the city. Photo by X. Simón

Urban and periurban green areas are increasingly understood as landscapes that can be used, consumed, and enjoyed, and which, for those reasons, must also be protected. In the city region of Vigo (Galicia, Spain), green areas and buildings alternate, blurring the differences between the urban and rural. Around 30 % of the land in the area is a common-pool resource, which requires specific property arrangements, decision-making processes, and management. In some cases the Commons are a good example of long-term vision and sustainable development. Here we present the case of the Association of Commons of Vincios, one of the SMEs of the SUPURBFOOD project.

The city region of Vigo (Galicia, Spain) is formed by 14 municipalities (approximately 479,256 inhabitants), and Vigo (about 300,000 inhabitants) is the largest urban municipality in Galicia in socio-economic terms and with regard to size. Located there are the largest European fishery seaport and an important car manufacturing industry, supplying jobs to about 10,000 employees in the city region. A major portion of the area consists of green infrastructure formed by public municipal parks, many scattered private plots in use for vegetable gardening and maize production, and commonly

owned and managed mountain land locally known as *Monte* (see box).

In Galicia, the Monte is managed by public authorities (the state) and private owners, with a part managed as common property. In this paper we focus on these commonly managed Monte areas. Currently there are 2,800 Associations of Commons in Galicia, which manage about 700,000 hectares of Monte, or 25% of the total Galician territory. Here, a “commons” means that the land is privately owned (as opposed to public state ownership) but managed by a group of neighbours of a specific parish. These managers have the right to make decisions on what is carried out on the common land. These decisions are made in assemblies and must comply with the statutes of the Association of Commons, which are framed by legislation and based on century-long traditions. Commons cannot be sold, inherited, divided or expropriated.

In the city region of Vigo there are approximately 100 of these commons managing 24,400 hectares, which is about 32.5% of the total area. During the period of dictatorship (1939–1975), common property was lost due to an expropriation process. The Monte lost its multifunctional use during that time due to monocultural forestry policies, industrialisation and specialisation of farming, and migration from rural areas. Property went back to the Associations of Commons at the end of the 1960s when socio-economic conditions and conceptions of farming had radically changed. However, in the past two decades, some commons in the city region of Vigo are recovering the multifunctional

Monte in Galicia, Spain

The Monte in Galicia consists of forest and scrubland. In the past, the Monte was a space for both farming activities (pasture, cereal production, and fertiliser provision) and mixed forestry. In the past the Monte played a crucial role in supplying inputs to sustain the resource base of family farming (esp. in the case of insufficient land). The Monte has been linked to different forms of property: public (45,000 hectares), private (1,385,690 hectares) and commons (608,728 hectares). Associations of Commons manage 25% of the Galician territory, and in the city region of Vigo around 30%.

Commons are:

- *inalienable. Owners can never sell their share, and neither a government nor any other authority can neglect this ownership.*
- *imprescriptible. Owners never lose their rights to the land, except by expropriation for public needs (such as the construction of roads and hospitals, but also wind parks and mines).*
- *unseizable. The government or banks cannot confiscate land in cases of owner debt.*
- *indivisible. The land cannot be divided, it remains a commonly managed unit, and people must decide together on its objectives and management.*

use of the Monte through various projects. This activity could be an important step in further developing the city region's attractiveness, promoting the protection of green urban and periurban areas, and creating opportunities for income generation and employment. One of the most active commons in the area is the Association of Vincios, a partner in the SUPURBFOOD project. Over the past 20 years this association has carried out different projects to promote more sustainable uses of its common land, stressing the importance of recovering multifunctional land use and quality (food) products as well as biodiversity and leisure functions.

Use of the Commons in Vincios: biomass and multifunctional land use

Vincios, with 2,000 inhabitants, is located ten minutes by car from the centre of Vigo. The Association of Commons manages 678 hectares of which a significant portion (around 400 hectares) has been transformed, since the early 1990s, through the implementation of several projects for biodiversity and landscape protection, wild fruit production (chestnuts, mushrooms), and raising cultural and social awareness among community members.

Rather than taking the capitalist market perspective of quick returns on industrial investments, the aim of the Vincios Commons is to rebuild the resource base that has been

degraded through monoculture afforestation of Monte land in the past decades (Montalvo and Casaleiro, 2008). A side effect of monoculture forestry with eucalyptus trees is an increased risk of forest fires. When there is no good management or control after forest fires, Eucalyptus tree density increases, thereby further increasing the risk of forest fires. Moreover, the abandonment of traditional management practices makes scrubland with a high presence of Toxo (*Ulex europaeus*) and Xesta (*Cytisus scoparius*) grow uncontrollably, which is another reason for the higher incidence of fast-spreading forest fires in the region.

In order to break out of this negative cycle and to improve the profitability of the commons, Vincios carries out multifunctional land-use projects that aim to recover natural spaces and traditional landscapes. Those projects combine forestry, agriculture, stockbreeding, hunting and leisure while simultaneously preserving the natural, cultural and historic assets of the area. With this strategy, Vincios aims to reduce the risk of forest fires and to maintain land productivity. To this end, biomass from the Monte area – from removing scrubland as well as clearing up plantations, and thinning and pruning of trees – has been used in a pilot project for compost production. Inspired by the private enterprise Abonos Lourido (<http://abonoslourido.com/es/>), a pioneer in composting Toxo shrubs for high-quality organic fertilizer, the goal is to construct a biomass plant together with other Associations of Commons in the region. A pilot project as well as socio-economic and technical study carried out from 1999 to 2001 showed positive socio-economic and environmental impacts. In 2009 a viability study confirmed those results. In 2013 the biomass plant project was approved by the local administration after overcoming various administrative problems.

Meanwhile, the Vincios Association of Commons has implemented projects to improve soil fertility by combining reforestation with local varieties (eliminating Eucalyptus), using algae as fertilizer, creating pastures (for sheep, cows and horses) or producing its own compost at a smaller scale from available biomass. The community has realised, and also demonstrated, that the use of available biomass and the promotion of multifunctional land use provides opportunities for rebuilding and developing a food system grounded in proper management of the commons. Further expansion of the edible landscape, characterised by chestnut, mushroom and beef production in combination with the improvement of soil fertility, should bring opportunities to start new, productive activities. Beyond environmental improvements, Vincios has achieved economic returns from selling wood and also from renting soils for industrial uses; more importantly, the Association of Commons has reinvested those returns in developing the above-mentioned projects and activities, as well as other activities from which the earnings directly return to the community. By law, entities that manage Monte land are obliged to reinvest at least 40% of their annual turnover in land management and improvement – a minimum that Vincios easily meets, with a reinvestment of 65% in 2012 (Dominguez Garcia et al., 2014). Besides land-use projects (for which sometimes extra, external



Serra do Galiñeiro in Vincios, case study area. Photo by Vincios Association of Commons

subsidy was found), Vincios supports activities that improve the quality of life in the community. They reinvested another 32 % of their turnover in sporting and cultural activities and in the school canteen. In the future, the biomass plant could, beyond fertilising productive common land, result in additional cash flow through compost sales. At the same time, the new multifunctional land-use management and the use of green waste both reduce the risk of fire and its damage to the natural and aesthetic value of the area and provide an opportunity for reconnecting green areas around the city with the food system in the city region.

Multifunctional land-use projects of the Vincios Association of Commons

Extensive Cattle (ongoing since 2007). Goal: to support local economic development and to control scrub naturally, as well as encourage natural beef production.

Mushroom cropping by mycorrhization of pines and oaks (ongoing since 2010). Goal: soil recovery and mushroom production.

Chestnut afforestation (ongoing since 2010). Goal: to increase biodiversity, produce high-quality wood, improve landscape, diminish forest-fire spreading, and establish chestnut production.

Sustainable afforestation with leafy deciduous species (ongoing since 2007). Goal: to promote alternative models of sustainable forest production.

Biomass Plant (1999– ;yet to be implemented). Goal: to produce compost from green waste (pruning, clearing out) in the Monte, reduce forest fire risk, improve soil fertility.

Sensitive cartographies (2013). Goal: social mapping of values and management models associated with the Vincios Monte through the website <http://vincios.org/es/explorar-el-mapa/>

Key lessons

- Organisational forms such as the Association of Commons in Vincios ensure that edible landscapes become core business and an anchor for the planning, design and governance of cities that aim to preserve and create spaces for food production and ecosystem services.
- Societal needs occupy an increasingly prominent place in local policy on employment, health, social justice and sustainability. This should be anchored in a legal framework that remains to become better suited to city regions and to regional and national food policies.
- Support for this self-regulatory organisational form does not generate direct costs to local and/or regional governments and at the same time multifunctional land use is guaranteed. Private, individual initiatives would benefit most from training in ecological entrepreneurship by means of networks bringing together various stakeholders, including city region administrations.

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Short Food Chains in Rome: Context, experiences, policy implications

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Zolle distribution bike on the streets of Rome. Photo by Zolle

This article describes the main features of and trends in Rome's short food chains as they emerged in the exploration conducted for the SUPURBFOOD project (Grando and Ortolani, 2013). Three interesting initiatives are described that represent well the various short chain typologies: the multifunctional periurban farm "Agricoltura Nuova", the specialised retailer "Zolle", and "Campagna Amica", the farmers' markets organised by one of the main farmers' organisations.

The Rome metropolitan area

Rome municipality is characterised by a large agricultural area of 57,959 ha (ISTAT, 2010) on a total surface of 1,285 km². The range of agricultural and food-based relations between Rome and its surrounding countryside, however, goes beyond the borders of the municipality to involve large portions of the Lazio region. In this paper we will focus on short food chain initiatives in the municipal territory.

The municipality has more than 2.8 million residents. If we consider the whole metropolitan area (the municipality plus the towns, villages and rural areas which immediately surround Rome), and if we also take into account visitors, commuters and informal inhabitants, more than 3.5 million people consume food within the city.

The dominance of industrialised food chains and the expansion of urban settlements in the countryside has led to a sharp decline in the surface of farmed land as well as in the number of active farmers (Roma Capitale, 2011). Traditionally, however, direct links between urban population and local agriculture have always been strong, even in recent times.

The current relations between Rome and its surrounding countryside can be better understood in the context of the spatial distribution of the urban settlements resulting from the city's complex history. This results in:

- the presence of large green areas inside the city, even close to the city centre, which makes Rome very different from the classic compact urban settlement that characterises other large cities;
- a relevant periurban historical heritage and environmental richness, with the presence of agricultural land, urban and archaeological parks, and other protected areas, confronted with the interests of the economically and politically powerful building sector.

Green areas, in fact, make up two-thirds of the entire municipal landscape: one third of the city's territory still consists of agricultural land and another third is subject to a rigorous regime of environmental safeguards (Dell'Orco, 2012).

An overview on short food chain initiatives

Rome sports the common features of a large European metropolitan centre, with the diffusion of large corporate retailers and discount shops. Nevertheless, Rome's food

system is still characterised by a large number of street markets and corner shops especially dedicated to fresh food. Nearly every neighbourhood has at least one daily market, and these are where a large share of Roman households purchase their fresh food. Traditionally the stalls were owned, or rented, by local producers who moved into town daily. Nowadays, this is not always the case, yet in every market a share of the stalls is reserved for these local producers. Short food supply chains (SFSCs) are thus traditional in Rome. However, in the last 15 years a range of more “contemporary” experiences have emerged.

Successful cases of box scheme initiatives exist in Rome, promoted by the various players of the chain: farmers, retailers, consumers. In 2000, the Cooperative Agricoltura Nuova, together with other organic farmers of the region, promoted the box scheme “*Officinae Bio*”. It was the first “offer group” of organic farmers in Rome mainly directed at aggregated consumers, and still among the most popular. In the following years several other consumers groups have been created in different areas of the city, representing an interesting market for organic farmers.

In the same years the concept of critical consumption also developed in Rome. Consumers, following the experiences of the fair consumers’ group born in Northern Italy, aggregated families’ demand for collective purchase of food and other products with ethical values (www.retegas.org). A 2011 paper accounts for more than 90 consumer groups active in Rome, with diverse characteristics and life spans (Fonte et al., 2011). The growing of consumer groups offered a new market opportunity to many other small farmers.

The cooperative Agricoltura Nuova (CAN) promotes another type of SFSCs that do not just deliver food but also add value to their production. The multifunctional farm was created in the 1970s on public land with the aim of putting a halt to the unregulated expansion of urban settlement on agricultural areas. Today the areas of the farm and its surroundings have been recognised as a natural park. The farm products are sold through a range of SFSCs. Two direct selling points have been established on two sites on the farm. In the main one, organic products from other local farms are also sold, in order to provide customers with a wide range of products to buy while ensuring a retail point for other organic producers farther away from the city. In addition to its primary activity, CAN also provides diversified services to the city both “on-farm” (direct selling, recreational sites, gardening courses and school farming, etc.), and throughout the city (biomass collection and composting, garden care). The farm is also experimenting with new development trajectories with the perspective of more sustainable resource use (solar energy, organic waste), and of ecological production methods (biodynamic farming).

The complex logistics of the city and the interest in this service by a larger group of consumers encouraged the creation of SMEs acting as local intermediaries between consumers and producers (see box).

Zolle is an intermediary that delivers fresh and processed food in Rome. The company works with small and medium-sized organic farmers mostly located in the countryside around Rome, but also at the national level. Farmers are asked to adopt non-intensive production methods (farming and grazing), adapt to seasonal cycles, and opt for local and regional species and varieties, both grown on-farm and exchanged at the regional level.

Products are gathered daily in the storehouse to be reassembled into single boxes, tailored to customers’ preferences, and then delivered throughout the city. The first leg of the transport from the headquarters to the delivery points is made with vans from a family transport company, but the final delivery to the consumers is made by bicycle. Zolle has contributed to the start-up of an autonomous bikers’ company that delivers boxes from the van to consumers.

Farmers’ markets are also increasingly successful thanks to the social tradition of street markets. Associations such as the “Terra Terra” peasants’ market or the AIAB organic farmers’ market in Testaccio are aimed at the more motivated consumers. In recent years however, Coldiretti, the largest farmers’ union in Italy, through its foundation Campagna Amica (“friendly countryside”), promoted several periodical farmers’ markets in various areas of the city and a permanent one in a public space in the city centre (Circo Massimo). The foundation promotes farmers’ markets throughout the country at which participating producers are periodically monitored, both by Coldiretti and by an external agency. These markets are occasions when visitors meet producers and experts and have the opportunity to buy and eat genuine food.

The three cases mentioned (CAN, Zolle, Campagna Amica) represent three different typologies of short chains. Their common aim is to establish direct contact between producers and consumers, while giving small farmers the opportunity to market their products without being “submitted” to large distribution standards. CAN is large and structured enough to promote and manage its own delivery strategies, whereas Zolle grants smaller farmers access to customers they would otherwise hardly reach without the support of a specialised retailer. Similarly, Coldiretti lends farmers the institutional and organisational support to sell their products to consumers. These strategies can thus be seen as complementary in the development of a flexible range of short chains.

Connection with other policy fields

In the context of Rome, SFSC initiatives have a clear connection to at least two social and policy fields: urban land-use designation and urban food policy.

In many cases urban and periurban farmers are outcompeted by larger players when they try to enter mainstream food markets, i.e., to supply large supermarkets and/or food processing companies. SFSCs give them the opportunity to sell their products at a premium price, which can be fundamental for their economic survival. Furthermore, their location enables them to deliver a range of ecological and social services to urban residents (from urban composting to school farming and recreational sites) that can further strengthen their farm business. In the case of Rome, with its alternation of built-up and green areas described above, this potential is particularly relevant.

An interesting experience in terms of food policy is exemplified by the guideline being developed since 2000 by the municipality of Rome to promote the use of organic food in public school canteens (Sonnino, 2009). This food policy has great potential but is still scarcely aligned with SFCS initiatives. In some cases local farmers have managed to get involved in the food distribution to school canteens, despite complex EU regulation to ensure free competition.

Some policy reflections

Effective regulation can create opportunities to further develop SFSCs at the national or regional level. SFSCs are often based on informal arrangements – among small-scale actors with social and ecological priorities – in a continuously evolving environment. The scaling up of these experiences is often hampered by the strict regulation defined according to the context and character of global chains. Regional or national regulation should consider whether criteria are more likely to block than to encourage the bottom-up innovation developed by SMEs. The risk is to give priority to more experienced and skilled actors with an attitude oriented towards marketing and profit.

Other factors hampering the diffusion of farmers' markets in the city and farming activities in the countryside have to do with deciding who has the right to use certain public spaces. Policy solutions are needed to create synergies and complementarities between traditional and innovative approaches to short chains, and among the different interests they represent.

As suggested by Brunori and Bartolini (2013), support should go not only to physical premises and infrastructure, but also to initiatives that support network creation and social capital, innovative project design, and the adoption of self-evaluation tools. (In the SUPURBFOOD project such tools have been developed jointly by participating SMEs and researchers.) Local authorities could act as brokers and facilitators, to encourage cooperation instead of competition among actors (farmers, retailers, urban gardeners, technical entities). The creation of online social networks, where people can come together, share experiences and develop joint actions, is an example of such initiatives that have been developed by Italian and foreign municipalities.

The development of “network agreements” or “network contracts” (recently allowed in Italy by Law 33/2009) among

farmers has been suggested in interviews and workshops for the SUPURBFOOD project as an innovative cooperative model. This could make it easier for farms engaged in SFSCs to share their workforce according to changing production and distribution needs. The idea is to establish collaborative conditions while respecting tax regulation, workers' rights and any other legal requirement. This could achieve more efficient coordination and aggregation of supply.

The organisational model of Rome's public administration is based much more on the *division* of competences than on their integration. In more general terms, the municipality has to cope with the presence of bureaucratic and procedural obstacles that hamper fruitful interaction among the competent branches of the administration and the initiatives that are developing in the field.

Policy areas such as food hygiene regulation, access to land for farming, gardening and farmers' markets, farmers' access to public food-procurement programs, green waste collection and processing, and urban landscape management could be brought together under the responsibility of a unique department for land use and food policy. Alternatively – at the least – this department could coordinate the various responsible bodies to achieve a coherent urban food and agriculture policy.

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Kalnciema Street Quarter in Riga: Food makes the place

Kalnciema Street Quarter (KQ) is probably the best-known weekly farmers' market on the left bank of the Daugava river in Riga. It started in 2009 and now has its "own clientele", including people from the local area and other areas of the city as well as tourists. KQ operates within a set of values involving sustainable lifestyle, inclusiveness, creativity and authenticity, maximising the opportunities provided by owning a unique ensemble of historical wooden buildings.

Along with running a market, KQ offers a range of cultural, educational, creative and culinary activities. This enlivens the whole neighbourhood and acts as an important landmark for tourists. A core approach in KQ's activities is openness to new challenges and ideas and experimenting with many kinds of activities, linking up with other initiatives and enthusiasts.

While KQ's customers are from Riga or are foreign tourists, producers may travel as much as two hundred or more kilometres, from the furthest southeastern or western parts of Latvia, with their distinctive food and cultural offerings.

With regard to the Riga city-region, the Kalnciema Quarter performs several intertwined functions:

- Creating a network of dedicated farmers, producers and artisans;
- Carrying out quality control for produce;
- Raising awareness regarding the value of local food;
- Providing market space for individuals who engage in small-scale gardening, food processing or crafts;
- Preserving a small communal garden on its premises
- Acting as a hub for new initiatives and product testing;
- Providing a multicultural experience with its thematic markets (e.g., Italian and Latgalian);

- Providing a space for community life for different social groups by offering artistic classes, exhibitions, lectures, wine tasting, and education about the wooden architectural heritage;
- Raising the profile of the neighbourhood and branding it as one of the creative districts of the city.

The development of KQ contributes to cultural and community life in the neighbourhood and provides a widely-known model of successfully linking local food, culture and community life.

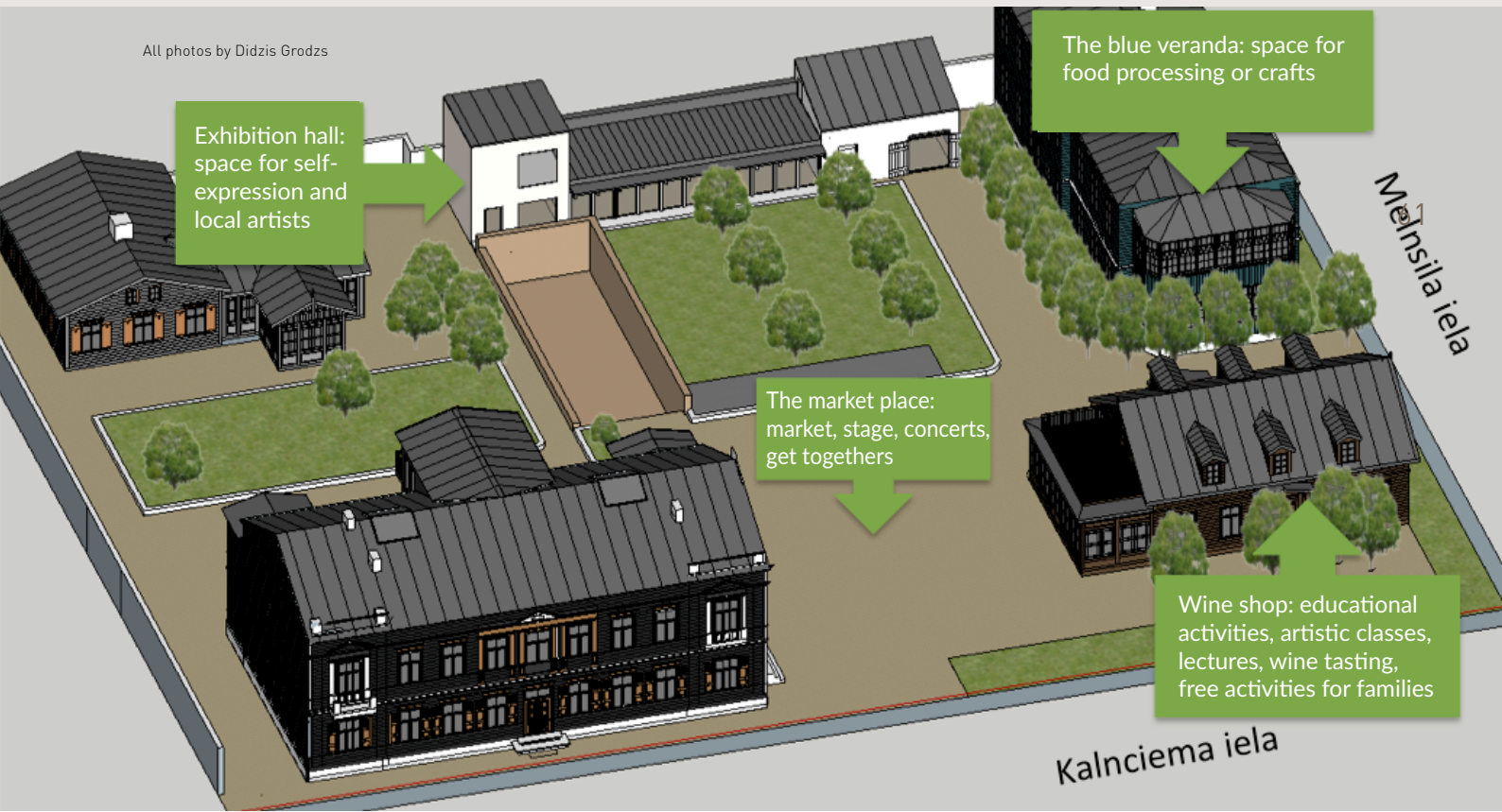
KQ is a place where various individuals, groups and organisations may meet, exchange and promote their ideas. The kind of space and activities that KQ provides is conducive to lingering, observing, sharing impressions – there is a coffee shop and multiple cosy corners for sitting outside in the garden; there are always sellers of seasonal food for immediate consumption, and something to watch on the small wooden stage. Creating a lively, social, open and distinctive space for a multiplicity of interactions and appealing to a sufficiently defined (yet inclusive) part of the population becomes a vehicle for perpetuating KQ's success and contributes to the unique identity of Riga.

The city government appreciates the contribution of KQ to life in the city. However, each time it needs funding for free public activities, KQ has to participate in open public calls for proposals. A promising new development is the dialogue started with the city's Department of Culture on developing a special multi-year grant mechanism for organisations like KQ, combining education, self-expression, community building, bringing local food into the city, and generally making the city alive.

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All photos by Didzis Grodzis





Cultivating the City: Infrastructures of abundance in urban Brazil

Jacques Abelman

A vision of the Praça as an intersection of recreational, community, and food production space. Image by: Jacques Abelman

“Cities have the capability of providing something for everybody, only because, and only when, they are created by everybody.” Jane Jacobs

Over the course of the last two years, the “Urban L.A.C.E: Local Agroforestry Collective Engagement” project has explored the potential of agroforestry to create a new type of infrastructure in rapidly developing urban areas in Porto Alegre, the capital of the state of Rio Grande do Sul at the southern tip of Brazil.

The potential of green infrastructures in the context of rapid growth

The economic boom in recent years in Brazil has brought with it a complex array of social and environmental challenges. Continued growth has added to the pressure on informal housing areas or favela neighbourhoods in urban areas. Although the general rate of favela formation has decreased in the last several years (The Brazilian Institute of Geography and Statistics, 2011), cities are increasingly stratified according to wealth. Currently over 50 million people still live in urban slums (Blanco, 2008). Together these urban inhabitants would form the fifth largest state in Brazil (Carta Capital, 2013). Public space is a contested zone where the urban poor compete for resources and economic opportunity.

An agroforestry “palette” of the native fruit species of Southern Brazil across a section of Porto Alegre. Image by: Jacques Abelman



As urban populations continue to expand, cities in Brazil must adapt to the spatial as well as the social needs of all their inhabitants in order to move towards just and sustainable urban models. New spatial practices must therefore be articulated in order to offer successful strategies for attaining these goals. Urban agriculture is a practice which can potentially address, simultaneously, urban spatial quality and access to food. Urban agriculture can create opportunities for livelihoods and new economic activities (FAO and World Bank, 2008). At the same time, networks of food-producing spaces can potentially increase the spatial quality of the city.

This project proposes colonising public parks, private land, public land, urban fringe spaces and fallow land with indigenous food-bearing tree species from the Atlantic temperate rainforest ecosystem. The trees are planted as orchards for intensive production, or in multi-species associations mimicking a natural forest.

In this region, there are hundreds of fruit-bearing and medicinal species which are all part of the living cultural heritage of Brazil. The process of building a network of productive urban agroforestry begins with a look into traditional and nascent practices in the area, from farmers' markets and the agro-ecology movement to guerrilla gardening and a growing interest in urban agriculture. Based on the actions, interests, and needs of stakeholders in the city, the project augments these actions into a large-scale urban network. The goal of the project is to manifest a clear and feasible, albeit utopian vision of future landscape infrastructure in a Brazilian city as a point of departure for future discussion and action.

Case study: Praça Bernardo Dreher

The Endres family are gaúchos (in Brazil, gaúcho is also the main gentilic of the people from the state of Rio Grande do Sul) with German and Portuguese origins. Oscar Endres ran a large market stall in the Mercado Central of Porto Alegre for over fifty years. He prides himself on knowing the origins and culture surrounding Brazilian food and its multitude of regional products, processes and recipes. Now retired, Oscar is an avid gardener. He and his family have lived in the

Ipanema suburb of Porto Alegre since the late sixties, a middle-class neighbourhood far away from the bustle of downtown. Ipanema's tree-lined streets frame well-maintained homes with fences and gardens. Security is an issue here, as slums are not far away and break-ins, sometimes at gunpoint, are not uncommon. Neighbourhood security guards watch from the shelter of small sheds on street corners, surveilling passers-by day and night through tidy lace curtains. At the end of the street there is a small park: Praça Bernardo Dreher. The park has lawns, some swing sets, large trees and a football pitch. I walk there with Oscar, who shows me with pride a leafy shoot protected by broom handles and pieces of wood. It is a goiaba (*Acca sellowiana*) tree that he has raised from seed in his own backyard and transplanted into the park. He treats it with care and visits it regularly. Other residents have begun to do the same. A seed of pitanga (*Eugenia uniflora*) or araçá (*Psidium cattleianum*), for example, will quickly grow into a shrub and then a tree in the favourable subtropical conditions. The trees yield abundant fruit, and in this neighbourhood the harvest is free for all who care to pick it. The municipal workers who come to mow the park lawns steer clear of the protected seedlings, and once the plants are established they seem to be absorbed into the design of the park. A dozen new fruit trees planted here over the years augment this neighbourhood landscape. Small acts of guerrilla gardening have become a shared neighbourhood practice, bringing residents out to meet each other. Eyes and ears in the vicinity are on the trees, also creating a safe area for children to play. An atmosphere of unease sometimes reigns in the suburbs, as though danger or violence could erupt if the wrong conditions arise. My hosts' accounts of incidents of crime confirmed this. However, that small children play in the park with no parents watching over them attests to the network of awareness around the Praça.

The Praça Bernardo Dreher is a good example of bottom-up and top-down meeting halfway. As the act of neighbourhood guerrilla fruit-tree planting is integrated into the life of the park, social cohesion is increased. The results are accepted and even maintained by municipal workers. Augmenting this practice could mean providing seedlings for free to those who want to plant them; almost all native fruit trees





The social context of the park essential to urban agriculture development. Image by: Jacques Abelman

and medicinal plants are available at the botanical garden or the municipal plant nursery. A landscape architect or planner's role could be to coordinate these plantings into better designs than haphazard planting. It would take a small number of interventions to achieve this; information could even be posted on site. The resulting food production could be distributed among neighbours, or simply left to those who need or want it. Harvest moments create occasions for people to meet each other around meals or celebrations. Fruit can also be gathered for sale in other areas, from a cart or a small stand, or even brought to the farmers' market. Processed fruits become fresh juices, preserves, and a variety of other products with potential small-scale market value.

First conclusions

Who has access to public space? In the capitalist market system, those without the capacity to buy or sell, and those who are not owners, are quickly and literally pushed to the margins. Landscape democracy in this context means an emphasis on inclusivity and connection.

The principles of the emergent field of landscape democracy allow us to see urban space as a field of negotiation between people, places, and power. Within this field, finding the everyday practices that link people and place make it possible to augment and connect these practices into a larger strategy. In this way the project has the potential to catalyse processes of urban evolution, with the landscape architect acting as a mediator. Based on dialogue, design, and the democratic ideal of inclusion, Urban L.A.C.E works toward this vision for change as one piece of a complex process.

Acknowledgements

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Green Vegetable Supply in Dar es Salaam

Marc Wegerif

Lingo on his bike selling mchicha. Photo by Marc Wegerif

This article constructs a picture of green vegetable growing and supply in Dar es Salaam by looking at the lives and work of a small trader and an urban farmer. It reveals the importance of a range of distribution and trade networks and the integration of a wider city region, alongside urban and periurban production, for the large-scale supply of these vegetables to urban eaters. The livelihood benefit for the many actors involved is clear as are some of the threats emerging as the city changes.

“Mchichooooo”, the booming voice rings out down the road, clearly audible from inside my house. Lingo is slowly cycling along, stopping when customers come out of their houses, a woven reed basket on the back of his bicycle loaded with green vegetables, including the ubiquitous mchicha (an amaranth leaf crop) that forms the core of his advertising call. He is also selling spinach, cassava leaves, pumpkin leaves, sweet potato leaves and mnafu (another green leafy crop). These vegetables are important in the diets of the majority of the more than 4 million residents of Dar es Salaam. At TZS 100 (Euro 0.05) a bunch, mchicha is one of the

most affordable foods around, and delivered to your door daily it is also one of the most accessible. These crops are core to urban horticulture in Dar es Salaam. Flood valleys alongside rivers, larger periurban plots, and bits of ground not built on around the city are frequently found to include small fields of mchicha.

I join Lingo on his daily bicycle rounds through parts of Msasani and Masaki. He delivers to small restaurants and other regular customers, stops at cheaper apartment complexes such as those owned by the National Housing Cooperation, and sells mostly to domestic workers in these relatively wealthy areas.

Just after midday, Lingo has sold about two thirds of his 200 bunches of green leafy vegetables and heads home to take a rest. I join him and his family for a late lunch at 16:00. We are sitting on a mat on the porch of a six-room house, one of which he rents and shares with his wife and three children. There is a large metal tray loaded with ugali (maize porridge), a pot with cooked mnafu, small fried fish on a plastic plate and fried shrimps, wrapped in newspaper, from a street food vendor. His wife’s younger sister is also eating with us, all from the same dishes. Lingo gives food to an old lady who lives in the same house. He adds fish and shrimps to her plate after she first takes only mnafu. I ask if they are related, and he explains that she rents another room in the same house – but “because we stay together I call her mama”.



Ilala market. Photo by Marc Wegerif

A bit after 17:00 Lingo leaves home again, this time cycling straight to a spot on the side of the road where he sets out his remaining stock on two upturned tomato crates stored at a nearby house. He carefully rinses the vegetables and stacks them on the crates, talking to his neighbouring traders and passersby as he works. The road is a dirt track just wide enough for a car to pass, but very few do; it is used mostly by pedestrians, with a few bicycles, motorbikes and push carts. Lingo is sitting about 100 metres from the Mikoroshoni market and the street is lined with shops and street traders. A constant stream of people is passing by, many coming from work, some stopping and shopping. Lingo stays at the roadside until his remaining stock is sold: at 22:00. He aims to make a profit of TZS 20,000 (Euro 10) a day. On the days I have been with him he has gotten just a bit less than that.

What may seem like a humble business is of central importance for Lingo and his extended family. He worked for a few years in a shop in the city centre, but left to go back to doing his own business. His wife looks after the family and has no other income. Of great importance for Lingo is that his children get the education that he never got. His oldest son just finished primary school, and Lingo is saving for the cost of sending him to high school. When I ask what he likes about

the work he says: “Business is my reason for being, it is my life”.

The following morning before 6:00 I am at the garden where Lingo gets his mchicha. This is where his bicycle rounds start and it is less than a kilometre to where he sells on the roadside. I go through a gate and, although we are next to a busy main road, there is a sense of quiet calm. The land around the two four-storey apartment buildings is planted with mchicha.

Two women who turn out to be mother and daughter are harvesting mchicha, tying it into bunches with strips of palm leaf and stacking them to be ready for buyers. Mama plants and harvests 400–600 bunches of mchicha almost every day, rotating across 20 small plots all on the same piece of land. Selling this, she secures an income of TZS 28,000–40,000 (Euro 14–20) a day. She started in 1990 and has carried on ever since. Her husband resigned from his job in the mid-1990s and joined her in farming. They used to grow other green vegetables such as spinach as well, but due to building in the area they have less land now and only grow mchicha. During the heyday of their farming they branched out, building a house nearby to rent out, or to move into if they have to leave the apartment they still rent. They bought a *daladala*¹ and now also run a small liquor store, but the mchicha

remains an important business that Mama Mchicha says she cannot stop. She has four children; the youngest is finishing high school this year and the others have finished high school and gone to college. The eldest has married and left home and the other three still live in the apartment surrounded by the urban farming that has supported them. That evening the son is in the field watering while listening to music on his smart phone. One daughter is not well, so she is sitting on a mat near the fields. The other daughter comes by smartly dressed, bible in hand, on the way to church. She says the mchicha farming “has a good profit. We work in the morning, then we can do some other things and come back and work in the evening”.

Mama Mchicha buys seeds in Kariakoo, the main market area of Dar es Salaam, or from passing traders who come to her with seeds and other inputs. Growing seeds herself takes too long so it is not a good use of her small amount of land. The only fertiliser used is chicken manure from local urban chicken farmers, but she says there are not enough chicken farmers now. She rarely uses pesticide, only sometimes in the rainy season when there are many bugs. Water for irrigation comes from a natural spring; she also uses tap water although they have to pay for it. There is no payment for the land: “I use it, and I keep it clean” she says.

Mama Mchicha sells to Lingo and to a few other traders who buy about 100 bunches each a day for the lower price of around TZS 60 (Euro 0.03) a bunch. “I reduce the price because they collect in bulk, and afterwards we also got to know each other”, says Mama Mchicha. She also loads a pushcart with about 100 bunches and walks around the neighbourhood herself, selling door to door for TZS 100 (Euro 0.05) a bunch. Not all of Lingo’s vegetables come directly from urban farmers. One morning I join him on his daily, half-hour *daladala* ride to the Ilala market. We enter the crowded, noisy streets next to the market buildings. Two lines of sellers are back to back in the middle of the road with narrow spaces, like congested aeroplane aisles, between them and two more lines of sellers on the outside edges of the road. Down side roads are more sellers and trucks offloading. “Cargo porters” are almost running through the crowd, shouting or making other noises of warning as they move, unstoppable, loaded with crates of tomatoes or sacks on their shoulders.

Lingo makes his way calmly through the throng. He talks to buyers and sellers that he knows, inspects spinach and other leaves and asks prices. He buys from different sellers, putting bunches into large plastic bags he brought with him. Most traders buy vegetables either from trucks that come overnight from Morogoro, Bagamoyo, Tanga and other regions that are hours (not days) away, or direct from farmers who bring to the market. The trucks, mostly the ten-ton Mitsubishi Fuso, are typically loaded with vegetables from a number of small farmers or traders, and the sale of the goods in Dar es Salaam is often facilitated by *dalalis* (agents) for a commission. Other traders go directly to farms in periurban areas – such as Kitunda, Kibaha and Kigamboni – and a few are farmers themselves, bringing their own crops from the same areas. It is not long before Lingo’s bags are full and balanced on his head as he leads the way out of the market and back to the *daladalas*.

What Lingo and Mama Mchicha are doing is not unusual.

Two other mchicha sellers, one on foot one on a bicycle, come to my street every day. They have similar sources of supply, one of them getting almost all the different green vegetables from farmers in periurban Kigamboni. People can also buy these vegetables from small vegetable stalls or from traders in the dozens of markets across the city, such as Mikoroshoni near where Lingo sells. Many of the traders at that market also go to Ilala Market every morning and some to urban farms; a few of them grow for themselves.

Mchicha growing and trade is an important source of livelihoods for thousands in Dar es Salaam. Collectively, these peddlers – along with small farmers, traders and transporters in the regions – are supplying the city at scale. The trade networks reaching into the city region and distributing around the city ensure that the growers, urban and rural, can sell and that the city can eat. They also add economic and social value through the additional incomes generated.

The changing nature of the city and its demographics is bringing challenges. Mama Mchicha has lost land they used to farm as the area got built up, and the decrease in urban chicken farming is threatening her supply of manure. The same changes are affecting Lingo. As he explained it: “The people have left Masaki, they have gone, the foreigners have arrived and that is the reason business is now down.” The Masaki area has the highest concentration of expatriates in Dar es Salaam who, along with some of the richer Tanzanians there, are eating less local foods, buying more from the few supermarkets, and keeping less chickens. This, along with a lack of urban planning and little protection for urban agriculture, is threatening the cycles of production and consumption that Lingo and Mama Mchicha have at once been part of and depended upon for decades.

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Note

- 1) The *daladala* is the main mode of public transport in Dar es Salaam. They are privately owned, medium-size buses with no timetable, running set routes with government regulated fares.



250,000 Families! Reconnecting urban and rural people for healthier, more sustainable living

Stephen Sherwood
Caeley Cane

Much energy has been invested in informing political leaders about the problems of industrial food and the benefits of agro-ecology. Following three decades of focusing primarily on good farming, Ecuador's *Colectivo Agroecológico* now believes that people, as “consumer-citizens”, can and must take responsibility for a better future. Such a grassroots counter-response to “modern food” may play a key role in the transformation towards a sustainable and just city-region food system in Ecuador.

There is something fundamentally worrisome about a person's most basic activity – eating – undermining his or her ability to exist. Yet this is precisely what we have achieved in modern food systems, in which production, circulation and consumption distance people geographically, economically and socially from their food. In the industrialisation of a “good” we have created a series of unwanted “bads”: mass destruction of soils and water systems, erosion of agrobiodiversity, and wide-scale pesticide poisonings and deaths, not to mention the two related global pandemics overweight/obesity and climate change. It has become increasingly clear that our present-day modern food systems are jeopardising human health, the economy and the environment. Fortunately, growing awareness of this situation is sparking seemingly endless counter-movements across the globe, including Ecuador's lively *Colectivo Agroecológico* (Agroecological Collective).

In 2005, Ecuador's rural-based agro-ecology movements got together with an urban-based wholesale purchasing group, the *Canastas Comunitarias* (Community Food Baskets) to exchange experiences. One conclusion was that, in its enthusiasm about farming practice, the agro-ecology movement had inadvertently isolated rural producers from urban-based consumers. The resulting *Colectivo Agroecológico* shifted its attention from “good agronomy” to “food” – a more holistic platform, which seamlessly linked rural and urban people around a common cause. Their rally call became “food sovereignty”: food for the people, by the people, of the people.

The *Colectivo* played a central role in influencing Ecuador's groundbreaking 2008 Constitution and the subsequent national policy transition from food security (understood as merely meeting peoples' basic needs) to food sovereignty (an emancipatory force for democratic change). Despite seemingly wonderful laws on the books, ten years on there was a sense that this promising legislation had still led to little meaningful family-level change. People needed to become more proactive in their own well-being.

Discovering the consumer-citizen as a democratic force for change

It is far too easy to point a finger at governments and corporations as the source of “the problem” while ignoring one's own complicity as a consumer. We certainly agree that wealth-seeking industries are influential, but consumers are not mere victims. At the end of the day, people, through their daily choices and purchases, wield considerable influence. They effectively vote for their surrounding food realities and their consequences – both the “goods” and “bads” of modern food.



Families committed to invest at least 50 % of their budget in “responsible consumption”. Photos by Stephen Sherwood

Following a decade of advocating for food sovereignty, the *Colectivo* concluded that the dominant food system that it so fervently criticised – what may be the single largest industry on the planet (estimated to be worth over 1.3 trillion US dollars per year in places such as the United States and about 10 billion per year in Ecuador) – had become so influential in national politics that it was no longer realistic to expect government representatives to be able to correct things on their own. Ultimately, people operating both individually and collectively in the family, neighbourhoods and social networks that seamlessly cross urban and rural environments, must wrest control over their food territories and their futures. This is the vision of “consumer-citizens”: they are actively informed, take a position, and act in their own better interests.

The good news is that “the people who eat” are everywhere. Consumers live and operate in both urban and rural sectors, and they are involved in all levels of education, science, industry and government. While consumers may be responsible for the ills of modern food, they are also centrally positioned in the possibility of a better future.

Moving forward: 250,000 families!

As part of the National Festival for Food Sovereignty in the city of Guayaquil and on World Food Day, in October 2014 the *Colectivo* launched its “250,000 families!” campaign. The campaign is a five-year project to recruit a critical mass of 250,000 families – 5 % of Ecuador’s population – to identify families interested in taking charge of making food sovereignty a reality. Through shifting about half of the present food and drink purchases of this population, economists working with the *Colectivo* estimate that these consumer-citizens would amass about USD 300 million per year: more than the total spent on international cooperation for agriculture and health in Ecuador.

In order to become part of the 250,000 campaign, a family must address two questions: what does “responsible consumption” mean for me, and how does my family (business or community) practice it? The *Colectivo* has organised networks of volunteer promoters who record the responses to these

questions and upload them into databases and the internet.

The *Colectivo* has seen that families have richly diverse yet complementary perspectives on what it means to consume responsibly. Some mention investing in locally produced, organic, agro-ecological food or traditional Andean crops, fair prices, or simply preparing one’s own food. Others emphasise recycling and renewable energy. The response of five influential leaders – two urban farmers, consumer representatives, a chef and the hosts of a popular public radio program – can be found at https://www.youtube.com/watch?v=sh_npk14xul.

In addition to recruiting families for the campaign, the *Colectivo* has begun to organise local working groups of food activists to follow up on the emerging patterns of activity. Already they have seen a demand for informing people about existing alternative foodways, opportunities for organising new purchasing groups and markets, and farm visits, as well as courses in cooking, energy conservation and bio-construction. The possibilities seem endless.

Final thoughts

The consumer-citizen can be found everywhere, in both urban and rural communities. Through processes of reflection and acting more strategically on their concerted interests, the *Colectivo* believes that this emerging actor on the political scene is capable of transforming existing urban-rural relationships, thereby generating more vibrant, equitable economies, healthier patterns of eating, and more sustainable landscapes. A better future is bounded only by the limits of our interest in eating well and our creativity. If you eat, the *Colectivo* invites you to become involved and seek your own sense of responsible consumption.

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Unlocking La Paz

Monica Velasco B.
Anke de Vrieze

Urban garden of the foundation 'Alternativas' with La Paz city in the background. Photo by Monica Velasco B.

We are currently witnessing a change in educational priorities and professional practice. Many university curricula are adopting a new, more social and environmental focus, which we believe is related to the current rapid urban population growth and its vast consequences for our ecosystem. Future decision makers need to be prepared to face these challenges, and current professionals must learn how to address one of the most demanding challenges: How to feed the city?

This has inspired us to develop the educational project *Unlocking La Paz*, implemented in the city of La Paz in Bolivia. *Unlocking La Paz* aims to train young professionals to discover how urban challenges are related to the urban food system, how to improve the food system, and how to co-create innovative solutions for the benefit of the city. Above all, the project aims to raise awareness among future decision makers so that they can learn, act and implement social solutions. Becoming more aware of how much food shapes our lives enables us to realise that we live in a time in which we should consider food an urban design tool in addressing a number of social and city challenges.

Why Bolivia?

Currently, 70% of Bolivia's 10.5 million inhabitants live in cities. Furthermore, 50% of the urban population is concentrated in four urban centres: La Paz, El Alto, Santa Cruz and Cochabamba. The country's economy is growing along with international trade and global markets. However, as in many other growing Latin American countries, nutritional quality is decreasing and healthy eating habits are disappearing, causing an increase in rates of obesity and diabetes, especially among children. According to the FAO's 2014 "State of Food Insecurity in the World" report, Bolivia's extreme poverty has decreased by 17% in the last decade, mostly due to income redistribution. Despite this improvement, however, there are still areas – most of them urban – where malnutrition is a problem.

Bolivian agriculture plays an important role in securing food, as almost a third of the population lives in rural areas and practices farming. The government aims to increase the productivity of family farmers, address the immediate needs of vulnerable people through subsidy programmes, and facilitate access to food.

Why Unlocking La Paz?

La Paz is the highest administrative capital of the world, surrounded by the Andes mountain range and located 3,600 m above sea level. The city sits in a basin, surrounded by the high mountains of the Andean plateau. Its population, two-

thirds of which is indigenous, has doubled in the last 10 years.

La Paz is a city of exceptional wealth and unique characteristics. However, much of this wealth remains “locked up”. While it is the cultural, social and educational centre of Bolivia, this city is also remote and easily cut off. The acute problem is one of agricultural isolation. The city of La Paz produces little to almost none of the resources it needs on a daily basis. For example, the majority of the necessary food is brought from other cities or neighbouring countries, increasing the usage of fossil fuel, and causing environmental pollution. The food cycle has a dramatic influence on the city; the effects are not only economic, but also spatial, social and environmental.

Current developments

In October 2014, the City Council of the Municipality of La Paz adopted the Autonomous Municipal Act No. 105 on Food Security, the first law of its kind in the country. The goal of the law is to guarantee citizens the right to food. It identifies five areas of work:

1. Promote and strengthen local food production
2. Generate an efficient logistical system for the equitable distribution of food in the territory
3. Strengthen and diversify existing and new marketing mechanisms
4. Improve mechanisms for quality control and safety in supply centres
5. Offer nutritional education to more diverse age groups.

The law can be characterised as comprehensive, as it includes actions throughout the food chain. Born as a citizens’ initiative, it builds on and is validated by the participation of various actors, both public and private. This policy has been developed by the foundation Alternativas in collaboration with the Canadian organisation Feed the Children and the Catholic Society of San José.

Alternativas is an educational project that works with educators, children and teenagers, parents and other citizens to reduce vulnerability to food insecurity by implementing a series of socio-productive and educational activities. One of their initiatives is the urban garden *Lak’a Uta*, located on the East slopes of the city. This garden not only aims to encourage social interactions between the neighbours of the area, but also offers agricultural education and tries to provide families with healthy nutrition.

Before this food security policy was adopted, another inspiring foundation called Comunidad y Acción was already providing training and support to families in the city of El Alto in order that people have their own urban home gardens. In addition, this project supports families in building their own 12 m² urban garden inside their courtyards. Each family receives training on how to farm, on how to cook products they have never eaten before, and on the nutritional value of different food products. Currently, thanks to this foundation, there are around 180 urban home gardens in El Alto. Family health has improved and families have been

able to save money. The principal aim of this foundation is to improve family food security through locally produced food, not to commercialise it.

There is a clear need to connect these local community initiatives with the food policy of the local government as well as to link education and practice in the field of urban agriculture.

Unlocking La Paz develops short and longer training programmes where students and young professionals are invited to collaborate, learn, create and apply innovative solutions in the following fields:

1. Spatial & urban solutions
 - Decrease urban food traffic with efficient transportation
 - Restore and enhance historical market locations and make them more effective for users and sellers
2. Environmental solutions
 - Enhance urban greening, reduce harmful run-off, increase shading
 - Reduce environmental impact by enhancing consciousness about waste and sharing options for reuse of materials
3. Social solutions
 - Offer labour opportunities to former farmers who migrated to the city
 - Reconnect people with the Earth through gardening, and enhance the appreciation for the origin of food
 - Start a chain of knowledge and workshops in order to eventually offer a national training programme

The bottom-up approach of the training programme allows participants to discover local needs by exploring their neighbourhoods and learning about spatial, cultural and environmental challenges.

First and foremost, we believe in the benefits of knowledge exchange. So far, knowledge exchange between cities in the global South and North has been quite limited with regard to urban agriculture even though important lessons can be learned from (best) practices in the global South. Also, Bolivia has interesting experiences to share, such as the projects discussed here that have proven to be effective in fighting food insecurity and also contribute to education and empowerment, especially for women. The main challenge is how to upscale these experiences and apply them at the level of the city region. North-South exchange and collaboration could contribute to innovation and advancement in the fields of urban agriculture and sustainable food planning. The project *Unlocking La Paz* not only focuses on bringing Dutch knowledge of urban agriculture and innovative growing techniques to La Paz – it is aimed at facilitating a broader exchange of knowledge between the two countries.

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SUPURBFOOD

This Magazine features articles on research and policy development in partner cities involved in the SUPURBFOOD programme. SUPURBFOOD has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no. 312126 (see also www.supurbfood.eu). This edition of UA Magazine, which has been financially supported by this grant agreement, reflects only the views of the authors. The European Commission cannot be held liable for any use that may be made of the information contained herein.

**International Sustainability Unit**

HRH The Prince of Wales established the International Sustainability Unit (ISU) in 2010 to facilitate consensus on how to meet some of the key environmental challenges facing the world. These include food insecurity, reduced ecosystem resilience and the depletion of natural capital. The ISU's recent work focuses on the opportunity to improve food system outcomes by improving policy and planning for food at the city region level. This work has included supporting the launch of a Global Call for Action on City Region Food Systems at the 7th World Urban Forum in 2014, serving on the Advisory Group of Milan's Global Urban Food Policy Pact and convening the Global Collaborative for City Region Food Systems alongside FAO, IFAD, ICLEI, HIC, RUAF and IUFN. In the context of this partnership, ISU has co-funded the hard copy publication of this issue of the UA Magazine.

UA Magazine 30 Rural-urban linkages, joint issue with ILEIA

UA Magazine 30 meets Farming Matters 31.1! RUAF and ILEIA have joined forces to co-produce a magazine on rural-urban linkages. The joint initiative is a meeting of like-minded organisations that share unique expertise and perspectives. RUAF draws from grounded experiences in urban agriculture and food systems, and ILEIA from family farming and agro-ecology. This is an opportunity to explore and affirm the links between rural and urban in renewing our food systems.

The Magazine documents experiences from across the world where farmers and citizens engage to actively shape the way their food is produced and, in the process, blur the rural-urban divide. Rural-urban relations are radically altered through tangible linkages such as innovative marketing arrangements, migration, ecosystem services and knowledge sharing. And while these links between rural and urban are built and strengthened, new pathways towards sustainable food systems are being forged. New agro-ecological practices are developed, communities achieve food sovereignty, and youth and women are taking leading roles. On the one hand, we see a reaffirmation of several strong points of rural ways of living typical of peasants; on the other hand, urban initiatives by producers and consumers as well as renewed relations between city and countryside bring important new dynamics and reinforce more sustainable and resilient food systems. These local responses to globalisation in cities and countryside have in common that they are based on principles of agro-ecology, multifunctionality and social economy rather than on the logic of corporate business and finance. They show that family farming remains a determining force in the 21st century, and also that it increasingly takes root in urban and periurban settings and is forging promising pathways, in coalition with citizens, to tackle the food, environmental and climate crises.

This Magazine will appear in June 2015. More information: info@farmingmatters.org or h.renting@ruaf.org.

Articles for upcoming Magazines

Articles should be a maximum of 2000 words (three pages), 1300 words (two pages), or 600 words (one page), preferably accompanied by an abstract, a maximum of 5 references, figures and digital images or photographs of good quality (more than 1 MB). The articles should be written in a manner that is readily understood by a wide variety of stakeholders all over the world.

Please clarify in your article the concepts used. Also, present where these experiences were gained, and the main actors, impacts, related costs, problems/challenges encountered and solutions found, the major lessons learned, and recommendations for both practitioners and planners or policy makers.

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UA Magazine

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UA Magazine is published twice a year on the RUAF website (www.ruaf.org).

UA Magazine facilitates the sharing of information on the impacts of urban agriculture, promotes analysis and debate on critical issues for development of the sector, and publishes "good practices" in urban agriculture.

UA Magazine welcomes contributions on new initiatives at individual, neighbourhood, city and national levels. Attention is given to technical, socioeconomic, institutional and policy aspects of sustainable urban food production, marketing, processing and distribution systems. Although articles on any related issue are welcome and considered for publication, each *UA Magazine* focuses on a selected theme (for previous issues, visit: www.ruaf.org).

Editors, No. 29

This issue was compiled by Mariëlle Dubbeling, Henk Renting and Femke Hoekstra from RUAF with support from Han Wiskerke (Wageningen UR) and Joy Carey (f3 consultants co-operative CIC).

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