

Final Report

Cities on the Grow: Pathways to supporting the sustainable growth of urban food enterprises in London, Reading and Almere

August 2015

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Cities on the Grow

Cities on the Grow is a cross-disciplinary project that has been funded by Climate-KIC, an initiative of the European Institute of Innovation and Technology. It seeks to support the sustainable growth of urban food enterprises toward the implementation of more commercially viable business practices. It also seeks to secure the social and climate benefits of these enterprises while enhancing their role in city-regional food economies.

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Executive summary

Introduction

1. Urban food enterprises play a significant role in generating socio-economic and climate benefits. This community of craft and micro enterprises is diverse with regards to their ideological motivations and business models. Though their funding streams, albeit varied, are predominantly sourced from fixed grants. This places the viability of these enterprises and their potential benefits to local and regional economies, the environment and the communities they serve at risk.
2. The resulting need to identify commercially viable business models that secure the motives and potential benefits of these enterprises, as well as supporting policy and business support mechanisms, has led the European Institute of Innovation and Technology to fund this project as part of the Climate Knowledge and Innovation Community (Climate-KIC). It was a collaborative venture between Wageningen University and Deltares Institute (NL), and the University of Reading (UK).
3. This pilot study was aimed at investigating the local food systems of London (UK), Reading (UK) and Almere (NL) with the intention of establishing how urban food enterprises operating in these locations can be supported to realise their goals of localised, commercially viable, socio-ecologically just food systems.
4. The collection of reliable and valid data on a diverse and highly dynamic community of urban food enterprises, and their links to consumers and other businesses was a key concern of the project. Thus a range of quantitative and qualitative methods was adopted, including: surveys, stakeholder interviews, stakeholder observations and consultation, workshops and literature reviews.

What is an urban food enterprise (UFE)?

5. There is no hard and fast definition of what constitutes these enterprises. Nevertheless these socially innovative business practices seek alternative, local responses to conventional food systems, from inputs through to resource recovery and waste management. They operate under several legal designations, with diversity in both the scale and scope of business practices that span all stages of this cycle.
6. Average annual turnover of all London/Reading-based UFEs surveyed stands at €451,371 and their Dutch counterparts at €675,020. The average UFE in each instance possesses a turnover akin to that of a micro enterprise (\leq €2 million).
7. London/Reading-based UFEs surveyed averaged 9.88 members of staff, significantly higher than their Dutch counterparts, but with over two thirds of these employed on a part-time basis, excluding volunteers.

Definitions

Alternative food networks

8. Alternative Food Networks (AFNs) are emerging networks of producers, consumers, and other actors that embody alternative responses to conventional food systems, from inputs through to resource recovery and waste management.

Alternative food movement

9. The social movements, associated with emergent AFNs and their evolution, constitute the Alternative Food Movement (AFM). A number of self-styled alternative food movements are in existence today, notably the Food Sovereignty Movement, the Food Justice Movement, and the Slow Food Movement. Food also falls within the remit of other broader social movements such as the Transition Network.

Food systems

10. A food system is a cumulative measure of the processes undertaken throughout the food value stream or cycle, from inputs to production, processing, distribution, access, consumption, and resource recovery and waste management. References to local and city-regional food systems are suggestive of efforts to close the food cycle at these geographical levels. For the purposes of this project, local and city-regional food systems constitute negotiated products of their associated supply chains and wider geographical systems of production.

Urban agriculture

11. Urban agriculture can be defined as growing fruits, herbs, and vegetables and raising animals in cities, a process that is accompanied by many other complementary activities such as processing and distributing food, collecting and reusing food waste and rainwater, and educating, organizing, and employing local residents. Urban agriculture is integrated in individual urban communities and neighborhoods, as well as in the ways that cities function and are managed, including municipal policies, plans, and budgets (Five Borough Farm, n.d.).

Business incubators and accelerators

12. The business accelerator is an organisation where there is more evidence of progress, more investments made, more peer to peer support as well as more external support of UFEs, whereas incubators are more concerned with a 'safe environment' for UFE start-ups to explore commercial opportunities at a very low cost, with minimal external investing or support. Both organisations provide a platform for the multi-dimensional, inter-sectoral and cross-scalar engagement of networks of producers, consumers, and other actors. They can facilitate paths to alternative sources of capital, including ethical banks and crowd-source funding, state governments, economic development coalitions and other investors, raise the awareness of policy-makers to issues of UFE concern, identify areas for skills development, and promote the role of UFEs in local and regional economic development.

Key messages

Policy and governance

13. The capacity of food systems to simultaneously impact upon several priority non-food related policy areas, such as economic development, health and well-being and GHG emissions, can have the inverse effect of creating a 'governance trap' whereby the higher the number of interested parties, the greater the failure for any one individual community group or organisation to take up the food agenda as a means to addressing

wider social issues, including but not limited to food poverty, obesity, and the barriers to food access and choice over nutritious quality food and its causes. Avoiding this governance trap will require the modelling of complex policy interrelationships, with particular attention to the baseline work of food policy councils, food partnerships, and subsequent strategies and action plans.

14. This is a strategic planning challenge. If city-regional food systems are to be advocated in Europe, the urban–rural divide that is evidenced in the *spatial distribution* of Common Agriculture Policy (CAP) subsidies must be re-framed and better coordinated with European urban and regional development objectives/funding mechanisms. Moreover, minimum *spatial thresholds* for direct payments to farmers may exclude producers with smallholdings, and their associated UFE networks, from needed funding. This can further impede the inclusion of UFEs in city-regional food systems. Whereas the minimum threshold is 5 hectares for the UK (*avg. holding: 54 hectares*), it is 2 hectares for the Netherlands (*avg. holding: 25 hectares*) (Council Regulation (EU), 2013).
15. At the city-regional level, attention to the complex interconnections between food systems and other urban systems, such as (food) waste to energy and/or composting streams, will be required of urban planners. The business case that underpins this call for cross-border, inter-sectoral synergies is one of circular economies and ecosystems services. It is a business case that must equally take into consideration pre-existing issues surrounding the uneven distribution of ecological assets (and their social returns), and the disproportionate environmental burdens among economically disadvantaged urban residents.
16. Many of the actors involved in local food systems (particularly UFEs) are not willing to compromise on the ideological motives that inform their businesses. Indeed, for them to do so would mean that all interested parties lose out because the services that UFEs offer to society, such as community support, local jobs and skills upgrading, would be lost. As such, any policies aimed at supporting the growth of the sector must not have the adverse effect of squeezing out these ancillary services. A key goal for many local food networks is to improve access of quality nutritious food at prices that reflect fair wages; this also negates calls for urban food enterprises to solely target premium markets.

Alternative food networks and systems

17. Opportunities for UFEs relate to a mix of economic, and social, environmental and food justice motives that they selectively draw upon for embarking on their venture as an enterprise, and that motivates them throughout the process of ‘doing business’.
18. These ideological motives lie at the heart of UFE practices. They vary greatly between UFEs, with some placing particular emphasis on one or two select issues, while others seek to tie in a broad range of outcomes within their practices. This can make it difficult to establish a policy-making focal point around which to engage community food enterprise and their associated alternative food networks.
19. Variability of UFE motivations can undermine attempts at collaboration between UFEs, in terms of trade, sharing of resources and costs, and collaborative political action.
20. Without knowledge of their societal impact, UFEs are unable to advance their ideological and business objectives with the help of producers, consumers, and other actors. This includes the extent to which climate impact factors into the motives of these enterprises and their consumers.
21. Trust is a key factor highlighted by UFEs. That is, trust between the UFE and consumer, and between UFEs and other actors, is integral to the wider alternative food networks they inhabit.
22. Potential UFE benefits include: the creation of local jobs with an attention to neighbourhood-level entrepreneurship and economic development, especially among

economically disadvantaged urban areas; the range of unique local food initiatives that emerge from, and motivate, processes of community development and urban regeneration across diverse urban communities; and the creative reuse of unused spaces and buildings.

23. For many UFEs, however, their concern with a lack of economies of scale and a lack of market access only stretches so far as to ensure their commercial viability. In part, this could be causing, or at least may not be helping to ease, some of the bottlenecks encountered by many UFEs. Some of the crucial bottlenecks that this study has identified, and which are a common feature of many small firms, are: the lack of entrepreneurial skills; the lack of access to finance; the lack of access to land; and the lack of a professional, shared marketing and sales channel.
24. Insufficient economies of scale also can serve to prevent UFEs from winning public procurement contracts.
25. Over 50% of UFEs surveyed chose to diversify their revenue streams to ensure commercial viability.
26. Other bottlenecks, which are less easily influenced by UFEs, include: regulation and policy adherence, which requires knowledge and time that UFEs do not possess (regulations concerning soil pollution, food and sanitary standards, or on-site processing); increased competition from supermarkets selling 'local' products; and the urban engineering skills and knowledge necessary to reap the potential climate benefits of linking the food cycle to (waste) water, organic waste, and energy streams at the city-regional level.

Environmental challenges and climate benefits of city-regional food systems

27. To maximise the potential climate benefits of urban agriculture, a number of barriers and/or challenges need to be addressed: the inclusive design and delivery of 'green' infrastructure, as well as the ability to identify 'healthy soils'; the (negative) effect of reduced solar radiation on plant productivity; and the potential risk of contamination to water and soil resources from the use of organic waste.
28. Business opportunities for UFEs include: 1) using municipal waste to provide a low price fertiliser to urban agriculturalists: 2) utilising previously contaminated sites, at zero rental, for food production. The stakeholder benefits of these opportunities are: improvements to soil health; reduced processing and transport costs associated with disposal; and phytoremediation strategies and solutions for the storage and buffering of contaminated storm-water runoff.

City-regional food systems in a global city, a regional town centre and a polycentric 'garden city'

29. UFE practices intersect and/or overlap with one or more stages of the food cycle within and across the project case studies. This in turn points to some of the real-life challenges UFEs face when trying to: (i) establish their own identity; (ii) distinguish themselves from the other actors operating within the many arenas that they inhabit; and (iii) convey this identity to consumers and other actors with whom they interact.

Flows of food and food systems

30. All but one UFE in primary food production cultivated produce in soil. On average, the Almere-based producers operate across 6.75 different plots while their UK counterparts operate from an average of four. Leases on the land for all producers ranged from 1 to 30 years with notice to vacate the land averaging around six months. 75% of R London/Reading-based producers said they have made changes to the use of the land they operate on compared with 50% of their Dutch counterparts.

31. Complications with securing such changes included some confusion as to whether planning consent was required to make the necessary changes; assessing whether the tenancies are secure enough to justify: investment of time and finance in the plots; contaminated soil testing; complexities involved in gaining organic certification; and gaining access to land at the outset.
32. London/Reading-based producers estimate that over 80% of their produce stays within the city in which they are located, compared with around 70% for their Dutch counterparts. This may be related to the types of products produced and whether they are suitable for direct consumption, or targeted for food processing into secondary products. As food processing plants are often based outside major cities, produce intended for processing will often need to be transported greater distances.
33. London/Reading-based UFEs engaged in food retail/catering source over 75% of their produce from outside of the city. This appears to remain the case despite estimates by London/Reading UFEs, engaged in food processing, who claim 90% of their produce post-processing stays within the city in which they are located; this share exceeds that of their Dutch counterparts. This could suggest that there are no significant levels of trade and interaction between UFEs. An alternative suggestion is that demand for the type of food being retailed outstrips city supply and thus has to be sourced elsewhere. This could be in terms of quantity or, perhaps more likely, the requirements for a wider range of food products. Whereas producers may be driven by local, and seasonal and organic produce, retail and catering may be seeking to supply organic and fair trade, possibly low meat and wholefood consumer demands. Encouraging vertical integration would be one way to increase local supply from primary UFE producers to the catering and retail end of the equation.

UFE and consumer motivations

34. London/Reading-based UFEs' desire to make a profit factors comparatively low compared with other competing statements of motivation. Enterprise funding sources may be influencing profit motivation. Whereas the UK relies on grants and donations, the NL does not.
35. There is a broad concern, between UK and Dutch consumers, for considering the impact of food-related purchases upon the wider environment and the climate. However, of those consumers surveyed, over twice as many London/Reading-based consumers choose to shop with UFEs as a response to this concern.
36. Almere-based consumers are more sceptical about the empirical validity of claims that local food produces positive outcomes for the environment, emphasising how the unreliable traceability of 'local' food acts as a barrier to them shopping with a UFE. This is in comparison to London/Reading-based consumers, where almost 10% more consumers believe they do have adequate information to establish the traceability of a particular product; this is likely due to consumer choice by location/context, such as shopping with farmers markets and shops, to ensure localness rather than a label of clearer traceability.

Barriers to urban food enterprise and consumers

37. Noted UFE barriers include: the inability to compete with the economies of scale of mainstream competitors; achieving a consistent supply of produce; consumer resistance to change in habits (where consumers do not value the UFE value proposition); small market potential/market access; the ability to judge the value/price of produce; and maintaining distinctive marketing edge. Altogether, these challenges would accompany any value proposition for a product that is not standard.

38. When asked if they felt their enterprises were disadvantaged by not being able to offer the same levels of convenience to consumers as supermarkets, 57% of London/Reading-based UFEs and 83% of Almere-based UFEs said 'Yes'.
39. The availability of regional food and convenience both score highly across all UFE consumers surveyed, although slightly less so in Almere. The cost of food is more of an issue for the Dutch consumers. Specific emphasis is placed upon the time and energy it takes to research and locate local food providers in the Dutch context. Despite this, the vast majority of participants would also like to see the procurement of local food integrated into public policy.

Opportunities to urban food enterprise

40. Financial investment upon start-up is primarily based upon bank loans and private investment for the Almere-based UFEs surveyed, whereas their UK counterparts in all but one instance rely solely upon forms of donation and community funding.
41. UFE responses to market access challenges are reflected in the multiple revenue streams of their business models. Over 50% of those surveyed said they had chosen to diversify their revenue streams as a means of ensuring their commercial viability.

Key action points

Roles and business models for business incubators and accelerators

42. Workshop participants distinguished between the business incubator and accelerator, maintaining a preference for the latter whereby established UFEs are guided toward maturity. The business incubator fosters start-ups.
43. Workshop results from this study suggest that the role of UFEs should be defined locally, because the circumstances and needs of communities are locally determined. We are particularly reminded of the importance of *trust* in this regard, of transparency and accountability in the interaction between producer and consumer.
44. The place of the UFE incubator or accelerator lies at the centre of complex cross-sectoral policy interrelationships and the diverse collections of community-based initiatives in any one locality. There is a need for brokering knowledge exchange within and between these policy and civic arenas, and their wider networks. This requires an approach where volunteers and professionals, working together for an incubator or accelerator, can act as serious complementary counterparts to other stakeholders in this complex field of play.
45. Business models for incubators and accelerators of UFEs could have an important beneficial role in the world of urban agriculture by helping to develop entrepreneurial skills. This could involve support with the following: obtaining funding to start a business; coaching on how to start with an aspect of the business that will generate early revenues to boost its further development; realising meaningful cooperation in a city-regional food system by encouraging complementarity across production scales and a diversity of production practices; developing a common marketing approach and retail network for urban and small-holder farmers; establishing institutional markets through public sector food procurement arrangements; lobbying the business case for urban/peri-urban access to land, as well as the case for food and nutrition security.
46. Needs expressed during the workshops and interviews that are not yet provided include: (i) entrepreneurial skills and knowledge development, especially on new financing mechanisms; (ii) leveraging and establishing new financing mechanisms, such as crowd funding; and (iii) providing a physical place or hub where demand and supply can meet, where the logistics of distribution can be organised, and where expertise can be exchanged.

Future research

47. Understanding the complex array of actors and ideological approaches is essential to effectively engaging those operating within alternative food networks on local policy and regional development concerns.
48. The dynamic entrepreneurial context makes the mapping of UFE activity difficult. Longitudinal studies of UFEs, in the face of the changing and mounting expectations of these organisations, would be useful.
49. There is a need to consider food and related funding mechanisms under the Directorate General for Agriculture and Rural Development (DG AGRI), namely the Common Agriculture Policy (CAP), in the context of wider urban and regional development objectives under the Directorate General for Regional and Urban Policy (DG REGIO). Territorial impact assessments of one set of policy mechanisms, on the other hand, are urgently required.

1 Introduction

1.1 Background of the project

This report is the result of a year-long project funded by the European Institute of Innovation and Technology as part of the Climate Knowledge and Innovation Community (Climate-KIC). The project seeks to support the sustainable growth of urban food enterprises (UFEs) towards the implementation of more commercially viable business practices. It also seeks to secure the social and climate benefits that UFEs can generate, while enhancing their role in city-regional food economies. The project was a collaborative venture between Wageningen University and Deltares Institute (NL), and the University of Reading (UK). It began in April 2014 with the aim of investigating the local food systems of London (UK), Reading (UK) and Almere (NL), with the intention of establishing how UFEs operating in these locations can be supported to realise their goals of localised, commercially viable, socio-ecologically just food systems. The project has focused on the potential benefits of local food systems for climate change mitigation and adaptation strategies, and on health and well-being. It has sought to understand how these potential benefits can be captured while also securing the commercial viability of the actors involved.

1.2 Aim of the project

The project was broken down into four core aims.

Research aims

- 1) Establish the potential benefits of UFEs for climate change adaptation and mitigation, and health and well-being.
- 2) Identify policy drivers and barriers to the development of UFEs at each stage of the food value stream.
- 3) Identify commercially viable business models that enable UFEs to secure their motives.
- 4) Produce a number of business incubator or accelerator models that can support both established and start-up UFEs to achieve their stated socio-ecological aims in a manner that is commercially viable and complementary to existing operators within the sector.

We have found that many UFEs have sought to deliver on a much broader range of socio-ecological outcomes than just health and well-being, and climate change adaptation and mitigation. Consistent with its remit as a pathfinder, the scope of the project therefore has

been broadened to reflect and capture the true breadth of interventions that have been pursued by many of the UFEs involved.

The multifunctional character of the food system means that it has profound effects on a host of other sectors — including public health, social justice, energy, water, land, transport and economic development.

(Morgan, 2009: 341)

This report acknowledges the great complexity and diversity of food systems and the importance of separating the potential for generating city-regional food systems from the divergent realities concerning issues of food poverty, obesity, and the barriers to food access and choice over nutritious quality food and its causes. The project has sought to build upon the growing body of research that has previously been carried out in this field by other European Union (EU) projects such as Foodmetres, Supurbfood, Foodlinks, Purefood and Urban Agriculture Europe. It also draws upon research carried out by a number of non-governmental organisations (NGOs) and community service organisations (CSOs), all of which have also begun to investigate short food supply chains, urban and peri-urban food production, policy opportunities, and training in the European context.

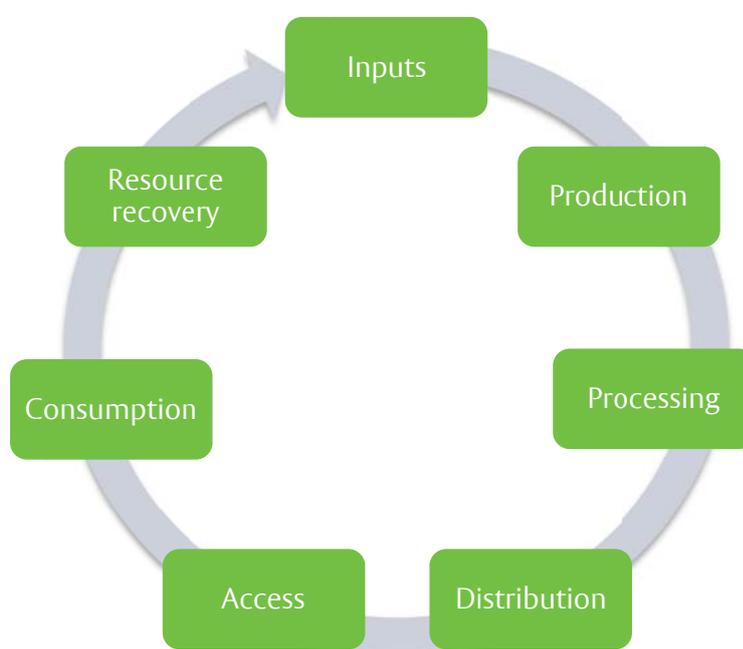
The project team has taken measures to distinguish this research from much of the uncritical advocacy and rhetoric often found within this area – particularly in regards to the overemphasis often placed upon the reduction of ‘food miles’ in the context of climate change. It also seeks to challenge assumptions that localised food systems necessarily provide more environmentally benign, just practices than those of operators within the conventional food system (Born and Purcell, 2006; Levkoe, 2011; Tornaghi, 2014).

The project therefore addresses multiple audiences across policy, business and community service arenas. It has sought to: (i) establish the potential positive and negative socio-economic outcomes of UFE practices that are not typically secured by conventional food systems; (ii) identify the plurality of UFE models and objectives; and (iii) co-propose different possible forms of support that might be required of a business incubator or accelerator if it is to be genuinely responsive to the ambitions and approaches of those enterprises it seeks to serve.

1.3 Project outline

The project has endorsed a systems approach, seeking to understand the cumulative impact of complete food systems (Figure 1.1). It has assessed the economic and social value streams of UFEs in city-regional food systems, as negotiated products of their associated supply chains and as complementary to the wider geographical systems of production. This approach is important as the socio-ecological impact of any food system is a cumulative measure of the processes undertaken throughout the food value stream, from inputs all the way through to resource recovery and waste management.

Figure 1.1 Example of a food system in its most intelligible form



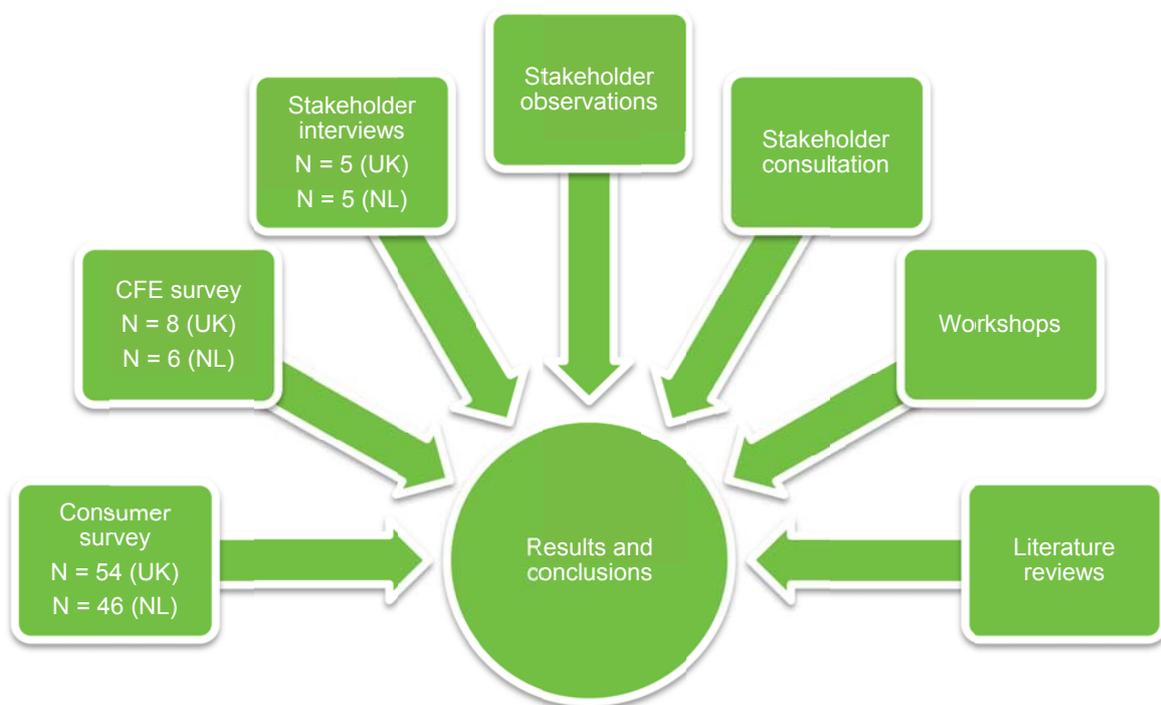
The project team has sought to understand the socio-economic and policy context of UFEs, and how this has influenced not only their economic contribution, but also their wider services to society including their climate impact. These public services may include work in disadvantaged urban communities, as well as the engagement of unemployed youth and growing for reasons other than food trade, such as being employed as part of mental health engagement in collaboration with public health authorities. UFEs consciously have set about to deliver on many of these other public services and thus have built them into their business practices. Therefore knowledge of UFE and consumer motivations, and knowledge of how this coincides with the approach of UFEs to educating and informing their consumers has been vital. An assessment of the climate impact of urban food enterprises operating through city-regional food systems economies must be understood within this context before policy recommendations can be reached.

1.4 Project research methods

The project adopted a range of quantitative and qualitative methods (Figure 1.2) including:

- surveys
- stakeholder interviews
- stakeholder observations and consultation
- workshops
- literature reviews

Figure 1.2 Research methods utilised by the project team



1.4.1 Surveys

Two online surveys were carried out during the course of the project, one of UFEs, and the other of their consumers. For the UFE survey, 8 completed responses were received from UK UFEs and 6 from Dutch UFEs. It is difficult to establish what percentage of those UFEs, operating in the case study cities, are represented by these figures because no comprehensive mapping of UFEs has been completed for the relevant cities. The second survey was directed at consumers of UFEs. It was designed to identify consumers' motivations for shopping with UFEs, and what influence UFEs have had over them with regard to maintaining their loyalty over time or driving them to opt out of continued involvement. For the UFE consumer survey, 54 completed responses were received from consumers in London/Reading (UK) and 46 from Almere (NL).

Both surveys were constructed in such a manner that they complemented one another, drawing out the ideological motivations of both the UFE and the consumer, and their differing impressions of value and reasons for shopping locally.

1.4.2 Stakeholder interviews

Food systems have a wide variety of actors because they come into contact with a wide range of policy and industry sectors. Stakeholder interviews were centred on policy and governance challenges of engaging such a variety of food systems actors. As such, several stakeholder interviews were carried out with UFEs, planners, and with a food growing programme manager, an economic development officer and a local councillor.

Interviews with stakeholders who have an influence on policy were designed to reveal their perspectives on the following: public benefits of city-regional food economies in relation to other policy objectives; any tensions between strategic actions that incorporate food into climate change strategies or local plans, and a wider regulatory environment that may be offsetting the full public value potential of city-regional food economies; current policy constraints on developing and/or reinforcing such city-regional food economies; the availability of, or need for, resources, infrastructure, financing and other services; and any additional information or data required for the future policy delivery of city-regional food economies.

Interviews of UFEs were designed to complement the UFE survey and workshops. The interviews were aimed at collecting insights from UFEs on what constitutes as alternative food business activity in their everyday practices, and the motivations and values that underpin them. The semi-structured discussions captured UFE narratives that identified links

to other UFEs, their support networks, and their perceived opportunities and barriers to the scaling up of commercially viable alternative food activities.

1.4.3 Stakeholder observations and networking

UFEs are small and largely rely on volunteer support, restricting the time they can contribute to completing surveys and interviews. However, the food scenes in London and Almere are active throughout the year, ranging from one-off topical networking events to annual harvest festivals. Given the time restrictions on UFEs, the project team took part in organised annual events and informal gatherings. We contributed to the Grow the City 'café' and the Harvest Festival in Almere, as well as local networking events in London. Participation at these gatherings enabled us to determine UFEs' political and ideological positionings independent of their common interests in food and the city.

1.4.4 Workshops

Three workshops were held in London and Almere. Workshop participants included UFEs, government agencies, NGOs and campaign groups. All workshops set out to determine the constraints and opportunities facing UFEs, and the role a business incubator or accelerator can play in supporting economically viable urban food enterprises (UFEs) (see Figures 1.3 and 1.4). The different sets of questions between the workshops in London and Almere are the product of stakeholder interviews, observations and networking. See Chapter 7 for the discussions of individual workshop aims and outcomes.

Figure 1.3 Outline of the London workshop

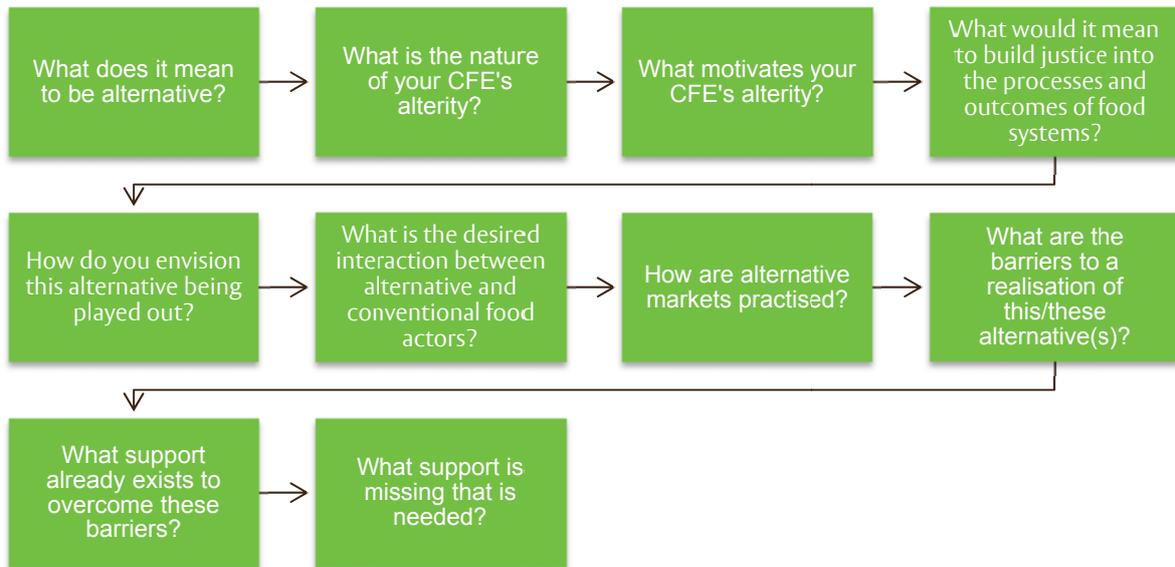
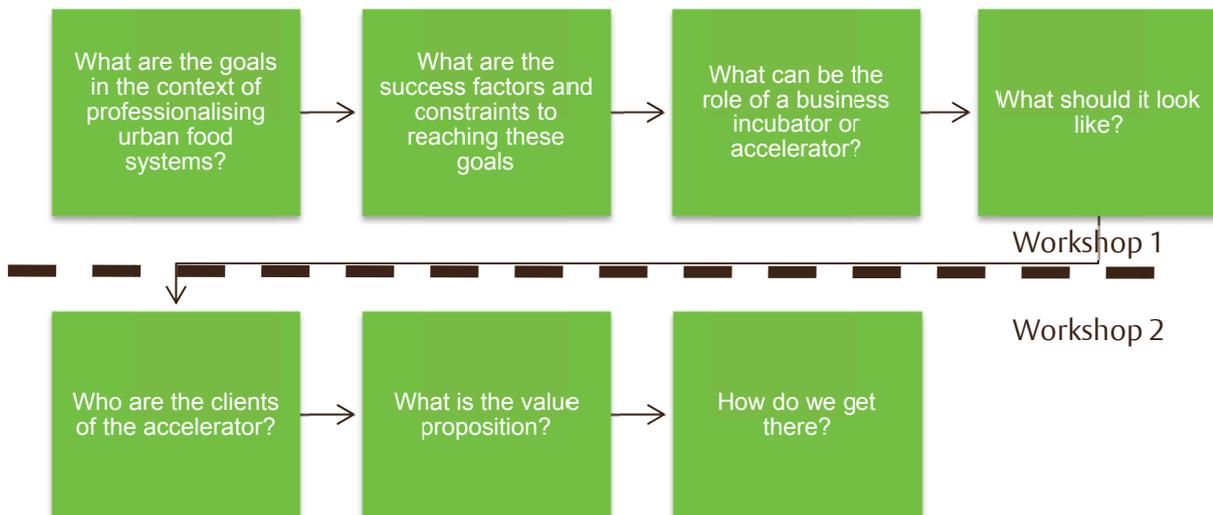


Figure 1.4. Outline of the Almere workshops



1.4.5 Literature reviews

Two in-depth literature reviews were carried out for this project. The first investigated the benefits of urban food systems for climate change adaptation and mitigation, and the opportunities and risks for business, related to environmental issues. The second explores the great breadth of literature on alternative food systems, networks and movements that have evolved over the past three decades, seeking to place this report firmly within this wider context.

1.5 Report structure

Chapter 2 provides a socio-political background to city-regional food practices. The potential climate change adaptation and mitigation effects of urban farming are discussed in Chapter 3, as well as the general environmental opportunities and bottlenecks for urban farming. The current policy context and landscape of urban food enterprises is described in Chapters 4 and 5 respectively, for London, Reading and Almere. We then review project findings from the two online surveys in Chapter 6 before assessing the role of business incubators and the selection of potential models for its implementation arising from the workshops in Chapter 7. Chapter 8 provides closing remarks on key findings and its implications for a UFE incubator or accelerator.

2 Alternative food movement and systems

2.1 Alternative food networks and movements

Alternative food networks (AFNs) can be understood to have emerged across parts of the developed world over the past 25 years as a response to multiple negative processes and outcomes incurred by the conventional industrial food system (Box 2.1).

Box 2.1 Overview of factors that have led to the creation of multiple AFNs

Perceived negative outcomes incurred by conventional food systems

- 1) Energy-intensive agricultural processes reliant upon fossil fuels that can have negative consequences for the wider environment, such as biodiversity and ecosystems, and the production system itself, e.g. animal welfare.
- 2) Distributive inequalities that find a significant percentage of the world's population in both developed and developing countries unable to access the quantity of healthy, affordable, culturally appropriate food they need.
- 3) Unfair market conditions throughout the agriculture and food sectors due to tariffs, subsidies and the monopolising practices of large corporate actors, including the call for a fair price for farmers and other workers.
- 4) Contravening of workers' rights and the desire for fair trade and cosmopolitan food politics.
- 5) Physical and mental health issues related to poor diet and lack of exercise, with particular emphasis upon the Western obesity epidemic.

The approaches, activities and scope of the various actors within these networks can vary considerably. However, most actors broadly assume the positive impact that alternative food activity and business can have for re-shaping food systems and wider society along more socially and ecologically sustainable lines, and seek to bring these to fruition utilising the following measures:

- shortened food supply chains
- reduced food miles
- the reconnection of consumer with producer
- higher quality of food

- reduced climate impact of food systems
- support for local economy
- reduced ecological impact of food systems

(Murdoch, Marsden and Banks, 2000; Renting, Marsden and Banks, 2003)

Since the early to mid-1990s, an extensive literature has developed on alternative food systems or networks (AFNs). These may be described as forms of food provisioning with characteristics deemed to be different from, perhaps counteractive to, main-stream modes which dominate in developed countries. (Tregear, 2011: 419)

Alternative food networks can be understood to exist at multiple scales and are made up of actors from across the food value stream, as well as CSOs, NGOs, consumers and citizens. They typically seek change to conventional food systems either: (i) incrementally; (ii) through some form of socio-technical transition; or (iii) by bringing to an end neoliberal mechanisms that commoditise food products, and which, AFNs claim, are directly implicated in the multiple negative processes and outcomes of the conventional food system. Subsequently, visions of what these alternatives might look like are posited and there remains no concise definition of what AFNs represent or seek to bring about. Goodman, DuPuis and Goodman (2013) argue

it makes analytical and heuristic sense to distinguish between networks that are market based, in some cases retail led, and those whose social reproduction lies fully or practically outside of the market.

Goodman, DuPuis and Goodman (2013)

The more radical rhetoric found within certain networks has led some commentators to liken the actions of AFNs to those of a movement. Indeed a number of self-styled alternative food movements are in existence today, notably the Food Sovereignty Movement (which finds its roots in the La Via Campesina movement), the Food Justice Movement, and the Slow Food Movement. Food also falls within the remit of other broader social movements such as the Transition Network.

There exists a broad spectrum of approaches to addressing the food dilemma and considerable crossover between those actors who consider themselves part of AFNs, and those who consider themselves part of Alternative Food Movements (AFMs) and/or wider social movements. This is palpable in the complex blend of entrepreneurship, advocacy, campaigning, political activism and political consumerism that one encounters at many of the

stakeholder/public meetings directed at addressing food systems and urban agriculture. This further emphasises the importance of understanding this complex array of actors and ideological approaches when attempting to engage with those operating within AFNs. The capacious landscape that encompasses AFNs is a heterogeneous space that harbours a broad array of ideologies, motivations and practices. Significant efforts in future research should be made to carefully distinguish between these different approaches if fruitful and progressive dialogue between these and other actors is to emerge.

2.2 What is an urban food enterprise?

There is no hard and fast definition of what constitutes these enterprises. Nevertheless, urban food enterprises are businesses run as social enterprises that have (for at least part of their operations) an active role in one or more stages of the food system. As social enterprises they differ from conventional businesses in that their primary objective is not to produce profit for shareholders, but to provide products and services in a manner that is socially and ecologically sustainable.

Urban food enterprises are run by and for the benefit of their community. Many of these community-level organisations, engaged in trading produce, may not be fully-fledged enterprises and/or may be more focused on training. Nevertheless, this sense of community can refer both to the enterprises of a local community and the benefits it produces for those with whom it comes into direct contact, and also to a cosmopolitan understanding of community and the impact UFEs can have for communities in a wider sense, particularly in relation to global commons such as climate change (Morgan, 2009).

Urban food enterprises take on a variety of forms and can operate throughout the food value stream. While some focus upon providing services within one stage of the food value stream (for instance, production) others may provide services at a number of these stages or for part of a stage. Some stretch as wide in their activities and services as to operate as standalone self-referential systems, while others offer services, which combined with other operators within both the alternative and conventional food arenas, come together to form food systems (Figure 1.1). Some will only conduct business with other actors who they consider to share common values, while others do not use such distinctions to dictate their practices. Urban food enterprises often trade with other independent businesses typically operating as part of AFNs, such as organic farms, independent butchers, bakeries, farmers markets and wholesalers, and regularly come into contact with community initiatives such as community gardens, transition town groups and community buying schemes. Both True

Food Co-op (Reading) and Brentford Market (London), for example, run youth training schemes.

Urban food enterprises seek to achieve multiple outcomes from their practices, including environmental sustainability, community cohesion, access to healthy food for all, ethical practices throughout the food system, and the creation of ethical livelihoods and wider social services. Their desire to address these multiple, interrelated factors can make it difficult to balance incurred trade-offs against pressures to remain profitable, particularly because meeting many of their wider aims can incur costs that the conventional food system treats as externalities (Agyeman and McEntee, 2014). However, these wider factors can also represent opportunities, both as forms of income for UFEs, but also as benefits for wider society.

In addition to offering their core food-focused services, many UFEs also undertake a variety of other activities often based upon achieving social outcomes. These can be motivated by: (i) necessity and the need to secure diverse revenue streams; (ii) opportunism and the desire to take advantage of other potential revenue streams available to them; and (iii) ideological motivations and the desire to meet perceived needs, often social and environmental, unmotivated by profit.

2.3 Urban food enterprises and multiple revenue streams

As with any other business, UFEs must secure stable and consistent revenue streams if they are to operate as successful, sustainable businesses. European UFEs currently face particularly hostile market conditions due to the climate of austerity that is significantly restricting the spending capacity of many consumers across the continent. This is compounded by significant competition from larger operators from across the food industry. Scale of operations can also serve as a factor in restricting the growth of UFEs as they are often unable to offer the economies of scale that larger operators can offer. This can serve to prevent UFEs from winning public procurement contracts and/or business with larger operators.

As a consequence of these pressures, many UFEs are forced to look for other revenue streams aside from their standard food-related practices. If they are able to provide services that meet their socio-ecological values and have financial value, for many this is entirely compatible with their business model. These new approaches could include:

- new products – such as cider production
- sale of produce to local restaurants and pubs

- events
- seminars
- venue hire
- farm walks and associated catering
- advisory and consultancy for other producers
- lecturing and public speaking
- corporate social responsibility days

A good example of such diversification is Five A Day Market Garden, a UFE situated in the village of Englefield on the western edge of Reading. Five A Day Market Garden is a not-for-profit, community-supported project, which aims to engage with its local rural and urban communities. It provides a number of products and services including:

- organic fruit and vegetables
- corporate team-building days
- community education for children and adults
- garden tours

The garden provides the opportunity for companies to demonstrate their corporate social responsibility (CSR) by volunteering for a local project that contributes towards the companies' local community. In exchange, the garden requests a £20 per person donation for team-building days, which allows it to subsidise other costs it incurs and sell its produce at 'affordable' prices.

Such diversification should not always be considered to be a reaction to the requirement to secure additional revenue streams. Many UFEs set out with the very intention of utilising food to address wider social issues. For example, Cultivate London, which operates across three locations in West London, has three central aims:

- to generate training opportunities and jobs for unemployed young people aged 16 to 24 in practical horticulture
- to convert derelict and vacant land across London into productive food-growing space
- to increase the amount of local and organically grown produce consumed by Londoners

2.4 Ideological motives

Ideological motives lie at the heart of the practices of UFEs. As community-initiated enterprises, their concern for commercial viability only stretches so far as to ensure their sustainability, seeking to achieve this in a manner that does not impinge upon their primary socio-ecological aims. These wider motives vary greatly between UFEs, with some placing particular emphasis upon one or two select issues, while others seek to tie in a broad range of outcomes within their practices.

These motivations are at the heart of their organization and often represent their key values and why they were created. This can complicate their economic model, as the social dimension of these enterprises means their business decisions aren't solely motivated by profit.

(Making Local Food Work, 2010)

These wider motivations not only present complications for the individual enterprises' business models, but can also undermine attempts at collaboration between UFEs, in terms of trade, sharing of resources and costs, and collaborative political action. Trust therefore becomes a key factor highlighted by UFEs. That is, trust between the UFE and consumer, and between UFEs and other actors, is integral to the wider AFNs they inhabit.

Virtually all accounts of local food benefits include a multiplier effect from the interaction or reconnection of producers and consumers; some piece of added value that is difficult to quantify because it relates to the perception of participants... many have suggested that these intangible qualities – generated by the direct exchange between farmer and consumer – are critical to the success of local food systems.

(Mount, 2012: 109)

Despite this claimed 'proximity' between UFEs and the consumer base, the elasticity associated with consumer behaviour persists. For example, recorded sales of organic produce in the UK present a mixed picture: sales fell significantly in the years following the 2008 global economic crash as consumers sought to roll back their spending, yet it rallied again in 2013 and 2014 as overall food prices began to fall (Soil Association, 2015) and consumers regained confidence. As such, while sales of organic products in the UK increased by 4% in 2014, the data still suggests that organic products remain the concern of those who perceive they can afford the price premium, and that consumer perceptions of

this premium are subject to change depending upon external factors, particularly finance (see Chapter 6 for full discussion of UFE consumer motivations).

As the principles of organic production are a prerequisite of the vast majority of UFEs, the growth of the organic market as a whole is central to their success. The creation of the UK Organic Trade Board in 2008, with its sole mission 'to grow organic sales in the UK', has helped to address the challenges of growing organic sales in a coordinated and collaborative manner.

Herein lie the deep complexities that UFEs seek to navigate. How can UFEs tie in the wider positive socio-ecological outcomes they wish to deliver, and yet compete with those conventional operators that continue to treat the negative socio-ecological outcomes associated with their operations as externalities (Holt-Giménez, 2010), without having to attach a price premium to their products and subsequently reinforce many of the inequalities they seek to address? Moreover, as conventional operators have begun to re-address and internalise negative socio-ecological outcomes associated with their operations, the competition for UFEs takes on a new dimension; the socio-ecological innovation of UFEs has been co-opted by major retailers. This raises fundamental questions regarding what is the most appropriate policy mix for supporting UFEs. It is when presented with such narratives that many involved in local food systems advocate more than a market-based approach to growing the urban food sector, and endorse political action to address what they deem to be deep-rooted systemic barriers and inequalities across complex policy inter-relationships.

2.5 The influence of UFEs upon their consumers

It should also be acknowledged that UFEs possess considerable potential to raise awareness of the social-ecological impact of food systems within their communities, and in doing so drive wider positive outcomes by exerting influence over the behaviours of those with whom they come into contact. For UFEs to be effective in this role they must themselves possess a good understanding of their climate impact as well as the potential impacts that different changes in consumer behaviours can have on cities.

Meat production is a major hotspot generating some 14.5% of total global greenhouse gas (GHG) emissions, using 70% of agricultural land, including a third of arable land needed also for crop production, and is a key driver of deforestation, loss of wildlife and land degradation, and water use. The 2014 IPCC report on climate change emissions identified changing diets as a significant though undeveloped area for action.

(Dibb and Fitzpatrick, 2014: 9)

For example Weber and Scott-Matthews (2008: 3508) find that 'shifting less than one day per weeks' worth of calories from red meat and dairy products to chicken, fish, eggs, or a vegetable-based diet achieves more GHG [greenhouse gas] reduction than buying all locally sourced food'. Researchers from Oxford University also found that 'eating meat no more than three times a week and replacing meat with plant-based foods would prevent 45,000 early deaths a year in the UK and save the NHS £1.2bn a year' (Dibb and Fitzpatrick, 2014: 9). Urban food enterprises could evidently make a significant contribution towards such an agenda by championing reduced-meat diets and offering alternative products, recipes and cooking classes to consumers. However, it is also clear that UFEs could overemphasise the importance of certain changes in consumer behaviour while undervaluing others if they possess inaccurate knowledge of these different factors, or if they wish to emphasise a certain narrative to further their own interests.

Significant efforts are being made to address this ambiguity, particularly in London, where a number of actors are seeking to corporately measure both their primary and ancillary outputs with the aim of demonstrating this collective value to their regional and national economy. This awareness of the 'need to develop better knowledge exchange mechanisms to explore joint solutions to common problems and disseminate good practice' (Morgan, 2009: 347) is something that is increasingly evident among those actors operating within London's AFN.

A further potential pitfall regarding the ability of UFEs to bring about changes in consumer behaviour is highlighted by Thøgersen and Crompton (2009) who find there is little to support the argument for a 'spillover effect', where a number of small, isolated changes necessarily lead to larger more significant behavioural change by consumers. They argue that such a piecemeal approach has little empirical support and can, in fact, lead to a sense of exchange entitlement – that performing one environmentally responsible action legitimates the undertaking of an unsustainable behaviour in another area.

However, Corner and Randall (2011) draw attention to two potentially promising avenues of influence for UFEs. The first is based upon the findings of Jones (2010), who finds that

communities that exhibit greater levels of social capital are more likely to engage with the issue of climate change as they are more capable of problem solving as a community. The second refers to the findings of Spence et al. (2010), who suggest that continuing to individualise the issue of climate change may lead to a 'governance trap'. They argue greater political leadership is needed, employing a community approach, rather than seeking to engender isolated, incremental behavioural changes from the individual.

This is reflected in much of the rhetoric found within AFNs, with concerted efforts being made to focus attention on the systemic causes of the negative outcomes of conventional food systems and address the many distributive inequalities around food that are understood to be a result of participative inequalities (Loo, 2014). Indeed, the notion of relying upon consumer market behaviour to bring about change to food systems is a controversial one as it arguably excludes those most keenly affected by the negative outcomes of conventional food systems from participating due to their low incomes (Alkon and Agyeman, 2011). As such, while many of those operating within AFNs recognise the importance in growing the alternative food market, particularly the organic market, there is also an increasing desire among many actors to curtail socio-ecologically unsound activities of the conventional system, and to challenge many of the wider systemic inequalities that are preventing lower income groups from participating in alternative practices.

3 Climate benefits and environmental challenges of urban food systems

In a short literature review, we have collected available knowledge on the climate benefits and environmental challenges presented to and by urban food systems. The identified climate benefits and environmental challenges are recast in the form of business opportunities that require complementary policy support. The effects of urban agriculture on climate change mitigation and adaptation depend on the type of agricultural practice (e.g. in greenhouses, in soil, in artificial substrates) and the difference with previous land use (e.g. leading to an increase or decrease of sealed soil surface or green areas). Specific types of urban agriculture can alter the urban environment and in this way can influence climate adaptation or contribute to its mitigation; similarly urban agriculture can reduce its environmental impact, if sustainable methods of production can be realised.

3.1 Climate benefits

Food systems contribute between 19–29% of global anthropogenic greenhouse gas (GHG) emissions, with primary production contributing the majority, between 80–86%. This is followed by refrigeration, then storage, packaging and transport in the post-production phase, and then fertiliser manufacture in the pre-production phase. Other stages include retail, catering and domestic food management, with pesticide production, waste disposal and energy use in animal feed production contributing the least (Vermeulen, Campbell and Ingram, 2012). In line with this assessment, Weber and Scott-Matthews (2008) find that 83% of GHG emissions related to food consumption are a result of the ‘production phase’. Though, they identify transportation contributing 11% of life-cycle GHG emissions, of which 4% is attributed to final delivery from producer to retail.

3.1.1 Climate change mitigation

The contribution to mitigation of climate change is assessed for two potential mechanisms:

- a reduction in energy use for the production of food, compared to production in rural areas
- reduced use of energy as a result of reduced transport distance between production and consumption location

The climate benefits and business opportunities generated by these mechanisms are discussed below.

Climate benefits

- The use of local resources leads to reduced energy demand.
- Locally produced food does not automatically lead to a decrease of 'food-kilometres', and transport results in only a small contribution to the total CO₂-emission of food production.

Business opportunities

- Renewable energy production in/for greenhouses.
- Employing local sources of heat and nutrients.
- Reduce food kilometres of consumers through new logistic models, like foodlogica.com (e-trikes).
- Stimulate the production of specific food, requiring less energy input.

Sharing waste water

In a city many different activities take place; some activities produce heat, waste or by-products that can be useful for agricultural production. Introducing agriculture as a new activity in urban areas gives opportunities to close or decrease energy, water and/or nutrient cycles.

In European cities, urban waste water is collected in the sewerage system and is transported to a waste water treatment plant. Human excrement and urine contain many nutrients that can be used to improve crop harvest by providing a substitute for mineral fertilisers (Wahab, Sridhar and Ayorinde, 2010). Substantial amounts of plant nutrients and organic matter are present in sewage, household waste and waste from the food processing industries (Skjelhaugen, 1999). However, culture, regulations and especially health concerns prevent the reuse of human excrement in agriculture (Refsgaard, Jenssen and Magid, 2005). Besides these barriers, household waste water is contaminated in the sewerage system with other pollutants (organic materials and heavy metals) from, for example, rain water run-off and drainage. However, at least in the Netherlands, many municipalities are separating rainwater drainage and waste water transport. Closing the nutrient cycle by reuse, for example agricultural production systems in urban areas, requires different systems for waste water collection, distribution and treatment than currently available in most Western cities. Only on a small scale and with an experimental status might this be realistic in the short term.

Fresh water for urban agriculture can be withdrawn from multiple sources in the city: ground water, drainage water, surface water, drinking water, rain water and/or (treated) waste water (van Oostrom et al., 2010). Many of these sources are also available in rural areas. Small amounts of water for high-value crops can be withdrawn from rain water collected at roofs or even drinking water (which is relatively expensive). A study in South Korea showed that collected rainwater from roofs can meet drinking water standards, especially when the first flush was diverted (Lee, Bak and Han, 2012). A small-scale study showed that there were no alarming concentrations of nutrients or micro- and macroparameters in the drainage water from roofs in several residential areas in the city of Utrecht, although some water quality norms were exceeded (Buma and Garming, 2007).

Organic waste management

Using organic waste streams resulting from urban agriculture can generate climate benefits, for example through biodigestion. Through the biodigestion of waste streams from urban agriculture (manure and crop residues), biogas, electricity and heat can be produced for residential areas and office buildings. An example is the Polderwijk in the town of Zeewolde in the Netherlands, where manure from an urban farm is co-digested with waste streams from the food-processing industry and with residues from roadside clearing. The biogas is used to supply 3,000 houses in the Polderwijk (Figure 3.1) with heat and electricity, reducing CO₂ emissions by 50% compared to conventional energy provision from fossil fuels (Veen, Breman and Jansma, 2012).

Figure 3.1 The Polderwijk, Zeewolde, The Netherlands



(Source: www.essent.nl)

As a resource for urban agriculture, organic waste can be used as a soil fertiliser, in animal feed and in energy production (van Veenhuizen, 2006; Anastasiou et al., 2014). Urban areas generate large quantities of organic residuals that can be used as soil amendments or independent substrates. The local food enterprise RotterZwam (www.rotterzwam.nl) grows fungi on a substrate of coffee grounds. After the use of the substrate, enzymes are extracted from the fungi, and the residue is composted. Land application of soil amendments derived

from organic waste can accelerate carbon storage and can replace synthetic fertilisers (Brown, Miltner and Cogger, 2012).

The EU-funded Fertiplus project (www.fertiplus.eu) developed technologies and strategies to convert urban and farm waste into compost, biochar and combinations of organic amendments with biochar. Experiments on peri-urban vineyards in Italy showed that compost blended with biochar reduced GHG emissions and increased the supply of nitrogen. It should be noted, however, that the organic waste streams available in urban areas are mostly rich in nitrogen and phosphorus, but may lack potassium (K) or certain micronutrients (Wang et al., 2008).

Climate benefits

- Organic waste streams from cities and from urban agriculture can be used for biogas production, thus reducing GHG emissions from fossil fuels.
- Compost and biochar from urban and farm waste may reduce GHG emissions from urban agriculture.

Business opportunities

- Organic waste streams from cities can be reused as a resource for urban agriculture in the form of organic fertiliser, animal feedstock or soil amendment.
- Advisory services for the blending of organic waste components for the applications mentioned above. An example is Tacoma Grow (TAGRO), an environmental service of the City of Tacoma, US, selling blended biosolids and gardening components for landscaping and vegetable gardens (www.cityoftacoma.org/tagro).

Connecting energy streams

Urban areas offer the potential for various forms of renewable energy technology, such as solar energy (photovoltaic and heat panels), cold-heat storage and biomass. These technologies may offer alternative energy supplies for heating, lighting and machinery in greenhouses and farms in office buildings, and therefore reduce the need to produce energy from fossil fuels.

Industrial waste heat can be used to warm buildings in urban areas, but usually there is no demand for this heat in the summer. Absorption heat pumps and absorption coolers can utilise this heat to heat and cool buildings or greenhouses (Salcedo-Rahola, Van Oppen and

Mulder, 2009). The technology would offer possibilities to warm greenhouses in urban areas, or other closed environments used for urban farming, such as offices (e.g. the urban farming project De Schilde in The Hague, the Netherlands; www.stadslandbouwdenhaag.nl; Figure 3.2).

Figure 3.2 Impression of urban farming in an office building: De Schilde, The Hague, the Netherlands



(Sources: <http://stadslandbouwdenhaag.nl> and Tycho Vermeulen, Wageningen University)

Reducing transport distances between food production and consumption

Urban agriculture offers possibilities to reduce the transport distances between production and consumption. Shorter pathways between producer and consumer might reduce GHGs related to transport (Sukkel, Stilma and Jansma, 2010). Scheer et al. (2011) divided the agro-logistic chain into three parts: (i) producer to processing company; (ii) processing company to retail/distribution centre; (iii) retail/distribution centre to shop. A fourth part could be added to this list: transport from shops to consumers (i.e. households or public facilities such as restaurants or canteens).

The literature discusses both positive and negative outcomes of the impacts of transportation and energy efficiency in shortened food chains (Blanke and Burdick, 2005; Demmeler et al., 2004). The latter is associated with shortcomings in structural logistics optimisation, i.e. small vehicles, low volumes, many individual routes and points of sale. Coley et al. (2009) and Schlich and Fleissner (2005) also stress that locally produced food does not automatically lead to a decrease of 'food-kilometres'. Finally, they conclude with the notion that transport results only in a small contribution to the total CO₂ emissions of food production. In two other studies the contribution of transport was only 1.49% (European pigs) or 0.98% (Dutch tomatoes) to the total CO₂ emissions. Seasonal outdoor products and glasshouse products can be complementary in time, which results in opposing transport

directions between markets during the year. Also, seasonal differences between the northern and southern hemisphere result in complementary harvests during the year. However, transport of these products costs less energy than storing (and cooling) local products during longer periods (Scheer et al., 2011).

The EU-funded FoodMetres project sought strategies to shorten food supply chains in metropolitan areas, by, for instance, reducing the actual distance that food travels (www.foodmetres.eu). In an expert survey, the impacts on the environment, economy, society and culture were assessed for eight types of regional and short food chains providing food for urban populations (Box 3.1). Food chains of the 'urban gardening' type (both for private consumption and for commercial purposes) performed best in the reduction of transport distance, according to the experts. Efficient resource use and reduction of GHG emissions scored best for chains of the AgroParks/Metropolitan Food Clusters type, in accordance with their design to obtain an overall chain of sustainability (Zasada et al., 2014).

Box 3.1 Food chain types examined in the FoodMetres project

a) Urban gardening for self-supply/private consumption (subsistence): food production in the urban setting for own consumption.

Relation type: consumer as (co)producer

Subtypes: allotments, community gardens, self-harvesting gardens (offered by a farmer)

b) Urban gardening for commercial purposes: profit-oriented food production in the urban setting.

Relation type: business-to-business

c) 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.

Relation type: consumer–producer–partnerships/cooperatives

Subtypes: community supported agriculture (CSA), ethical purchasing groups (EPG), solidarity purchasing groups (SPG), and food coops

d) Direct sales/marketing on farm to the private consumer: farmers sell directly their products on their farm.

Relation type: business-to-consumer

Subtypes: farm shops and stands, pick-your-own

e) Direct sales/marketing off farm to the private consumer: direct selling of products from a farm on the market in the urban area.

Relation type: business-to-consumer

Subtypes: farmers and weekly markets, market halls, home delivery

f) Sale to regional enterprises such as the retail or hospitality industry (e.g. restaurants, hotels, pubs), which provide food for the urban population.

Relation type: business-to-business

g) Sale to public procurement and public catering: preparation and delivery of meals for collective consumers in the urban area: including intermediaries such as wholesale.

Relation type: business-to-business

h) 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'. MFCs are oriented towards the markets in the metropolitan region providing food for the urban population, but also to the world market.

Relation type: business-to-business

(Zasada et al., 2014)

Climate benefits

- Urban agriculture does not necessarily reduce transport distances in food supply chains, although it can for specific types of food supply chains.
- GHG emissions from transport represent a small share of total GHG emissions from food production.

Business opportunities

- The energy efficiency of local food systems can be improved by resolving shortcomings in structural logistics optimisation (small vehicles, low volumes, many individual routes, points of sale and storage, cooling).

Carbon cycling

Green spaces in urban areas managed for urban agriculture can be used to increase the overall carbon budget for urban ecosystems (Lal, 2012). Crops, agroforestry systems, peri-urban forestry and wetlands in urban agricultural systems may be used to sequester carbon (e.g. Tratalos et al., 2007; RUAF Foundation, 2013), but quantitative findings on the effects in the literature are sparse. The contributions that are reported are small (e.g. 0.2% of total city emissions in Manila et al., 2007, in Pearson, Pearson and Pearson, 2010), and other forms of urban agriculture may be net emitters due to methane emissions from livestock and manure (Pearson, Pearson and Pearson, 2010). Yet there are also reports on significant contributions. Kulak, Graves and Chatterton (2012) assessed the potential reduction in

GHGs related to the production and supply of food. An assessment that focused on the study of a 2.83 ha urban farm project in Sutton (UK) showed that GHGs could be reduced by up to 34 t CO₂ eq per hectare per year, which exceeds carbon sequestration rates for conventional urban green space projects, such as parks and forests. Long-term experiments in Tacoma, Washington (USA) showed that 19–81% of added carbon through soil amendments derived from organic residuals persisted 3–18 years after addition. Inferred from these findings, the application of residuals to pervious surfaces in the city would result in an annual carbon sequestration of 0.22 mg C per hectare per year (Brown, Miltner and Cogger, 2012), corresponding to 0.81 t CO₂ eq per hectare per year.

Climate benefits

- Land-based urban agriculture in the open air can be used to increase the overall carbon budget for urban ecosystems, but reports on net effects are ambiguous.

Business opportunities

- Urban agro-ecosystems with proven impacts on climate mitigation may be used in carbon-offset schemes.

3.1.2 Adaptation to climate change

The contribution of urban agriculture to climate adaptation is assessed for two potential mechanisms:

- effects of land use change to agriculture on water regulation
- effects of land use change to agriculture on urban local temperature

New urban agricultural activities can change land cover depending on the type of urban agriculture. For example, a vacant plot or park can be transformed into an agricultural field ('green to green') or glasshouse ('green to grey'). Roofs or paved surfaces can be transformed to green roofs or agricultural fields ('grey to green') or be replaced by a glasshouse ('grey to grey'). Such conversions may be considered against the background of climate adaptation strategies for European cities, which are currently promoted by the European Commission through various policy instruments. The main instruments are: the Research and Innovation Policy on Nature-Based Solutions; the 7th Environmental Action Plan; the Communication on Green Infrastructure; and the Thematic Strategy on the Urban Environment.

Climate benefits

- ‘Open air’ forms of urban agriculture increase the area of green and blue spaces in the urban environment, thereby reducing its vulnerability to flooding, water and heat stress.

Business opportunities

- A pool of various local, small-scale measures is recommended for climate-proofing cities (Rovers, Bosch and Albers, 2014). Urban agriculture could be one of these.
- The conversion of sealed spaces in urban areas to green and blue spaces will be encouraged by EU strategies aimed at re-greening and renaturing cities, and increasing green infrastructure. This offers opportunities to urban enterprises providing green and blue spaces.
- The economic value of green and blue spaces in urban areas in use for residential and commercial purposes will increase due to the expected increases of heat stress under climate change.

Increasing water infiltration and retention*Urban agriculture in open soil*

Paved soils generate higher water run-off during intensive rainfall than unpaved soils. For example, Levy (2009) calculated that community gardens have a 19% lower run-off rate than vacant lots in Philadelphia. Knizhnik (2012) assumes the run-off coefficients to be 0.55 for vacant lots and 0.08 for urban agriculture. This means an average yearly reduction of rainfall run-off of 85% when vacant lots are turned into community gardens.

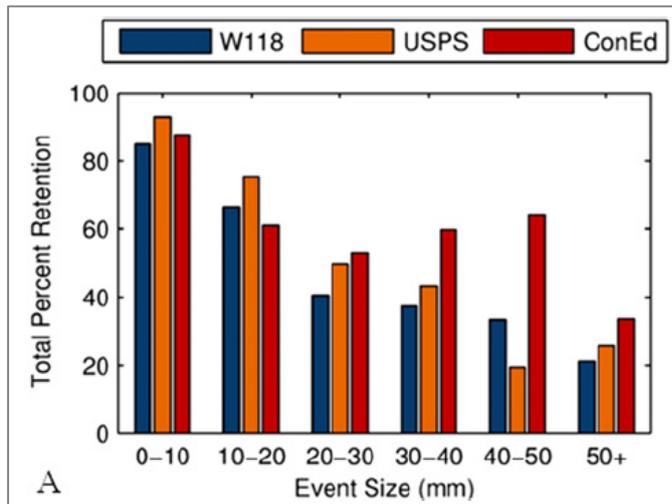
Urban unpaved soils are usually more compacted than rural soils because of building and/or demolition activities and (heavy) vehicles. Often the top layer is the most compacted layer (EPA, 2011). For both retaining rainfall and supporting urban agriculture, compacted soils should be amended. Gregory et al. (2006) measured the difference in infiltration capacity of sandy soils in Florida. They found that compaction treatments and/or construction activities reduced the infiltration capacity by between 70 and 99% (although there was wide variability). Kelling and Peterson (1975) measured the infiltration at nine urban lawns. Their results of the infiltration measurements show that the presence of textural and compaction discontinuities within the soil profile, formed during building and lawn construction, was probably the greatest factor affecting infiltration. Where these discontinuities were distinct, water intake was reduced to about 35% of that for a lawn with an undisturbed profile.

Unsealed soils in urban areas can be used to temporarily store water and to reduce peak discharges from surface run-off to the urban drainage system (Illgen, 2011). Dirven-van Breemen, Hollander and Claessens (2011) propose a series of technical measures to increase the retention and storage capacity in towns in the Netherlands. Some of these measures can be combined with the use of space in urban areas for agriculture, such as rain barrels or cisterns for fresh water supply, retention basins, subsoil drainage systems and artificial infiltration in injection holes. Ideally, smart-drains would be included in such systems to separate the first flush of storm flow, which has the largest loads of pollutants. Other practices to increase the retention and reuse of water in urban areas for the benefit of urban agriculture include: bioretention, the reduction of impervious areas, permeable pavements, wetlands and green roofs (Claessens et al., 2014), and the disconnection of contributing areas from sealed surfaces from the sewage system. Composting green spaces in urban areas is an example of bioretention. Plots with soil that had been amended with compost turned out to infiltrate 1.5 to 10.5 times more rainwater than plots that were not amended (Pit et al., 1999). Cogger (2013) concludes that, in the literature, the positive effect of organic components on improvement of the infiltration capacity is clear. The effect of organic amendments on plant available water is less clear; this means that the infiltrated water is not always available to the plants.

Urban agriculture on green roofs

Green roofs can be used to control storm water run-off in urban areas by attenuating peak flow and reducing run-off volumes. Carson et al. (2013) examined three different types of green roofs in New York City: a vegetated mat system on a residential building at Columbia University (W118); a built-in-place system installed on the United States Postal Service (USPS) Morgan general mail facility; and a modular tray system installed on the ConEdison (ConEd) Learning Center. These roofs have a substrate depth between 32 and 100 mm. Between June 2011 and June 2012, these roofs retained 36–61% of the total rainfall. Rainfall attenuation during individual storm events has a broad range for each roof, because the relative attenuation is dependent on the storm size (Figure 3.3).

Figure 3.3 Retention rate (vertical axis) for three green roofs (W118, USPS and ConEd) in New York City depending on the amount of rainfall during a storm event size (horizontal axis). The percentage retention is calculated as rain fall during the event minus roof discharge, divided by rain fall.



(Carson et al., 2013)

Berndtsson (2010) has done a review on experiments with rainfall run-off from green roofs. Table 3.1 shows the results for long-term averages as well as for peak run-off reduction.

Table 3.1 Overview of the retention of green roofs during the study period (long-term average) and during rain fall events (short-term reduction)

Reference	Rainfall retained in green roofs, average during study period (%)	Rainfall retained in green roofs, range for studied events (%)	Length of study period
Bengtsson et al. (2005)	46	–	17 months
VanWoert et al. (2005)	60.6	–	15 months
DeNardo et al. (2005)	45	19–98	2 months
Moran et al. (2005)	63 (roof 1)	–	18 months
	55 (roof 2)	–	15 months
Carter and Rasmussen (2006)	78	39–100	13 months
Monterusso et al. (2004)	49	–	4 rainfall events
Bliss et al. (2009)	–	5–70	6 months

(Berndtsson, 2010)

Knizhnik (2012: 26-7) cites a study of Dunnett et al. (2008) in which they point out that there are not many studies on green roofs that take into account the difference in the vegetation characteristics. The results of their study showed a relation between the vegetation type and the run-off reduction. ‘The results suggested that plant structure, such as size, leaf size and angle of branch would be more important for capture of water rather than how much they grow’. Khnizhnik (2012: 27) adds that ‘it can therefore be theorised that since most plants used in urban agriculture are much larger with broader leaf sizes than sedum species, there would be a strong advantage to urban agriculture on vegetated roofs as an alternative to largely non-native sedums.’

In the review study of Berndtsson (2010), the main conclusions about the effect of the vegetation on run-off are

that many studies agree that it is the depth and type of substrate that has the major influence on green roof water retention capacity and not the vegetation type and cover. However, it is also found that the vegetation plays a role in water retention and it is most pronounced in periods with low water availability and higher temperatures and negligible in winter (when the water availability is high).

(Dunnett et al., 2008b, Steusloff, 1998, Wolf and Lundholm, 2008, all in Berndtsson, 2010)

Compost filter socks are mesh tubes filled with composted material that are placed perpendicular to sheet-flow runoff from paved surfaces in urban areas. The compost filter sock provides a three-dimensional filter that retains sediment and pollutants while allowing the cleaned water to flow through (EPA, 2014). Studies from Faucette et al. (2009) and Faucette and Risse (2004) showed that compost filter socks can filter pollutants in urban runoff, like coliform bacteria, metals (but not Cr) and petroleum hydrocarbons. Removal efficiencies were found of 75% for coliform bacteria, 37–72% for heavy metals, and 43–99% for petroleum hydrocarbons. Compost filter socks were shown to perform similar to or better than grass filter strips and bioretention systems, and therefore could replace the latter where constraints on land area exist.

Figure 3.4 Installation of filter socks in a road ditch, Indiana, United States



(Source: Filtrexx International, LLC)

Climate benefits

- Urban agriculture in non-sealed spaces and on roofs contributes to climate adaptation by improving the capacity of the urban surface to infiltrate, buffer and retain rainfall and surface runoff.

Business opportunities

- Economic benefits may be generated from allocating open spaces in urban areas with soils suitable to grow high-value crops to urban agriculture, instead of other types of green or blue surface cover.
- Construction services for green roofs and compost filter socks.

Reducing urban heat island effect

Due to absorption of solar radiation by building materials, reduced evapo(transpi)ration and the emission of heat related to the use of energy ('anthropogenic heat'), the temperature in cities is higher than the surrounding environment: the urban heat island (UHI) effect.

Maximum temperature differences between cities and surrounding areas of up to 12°C are reported in the international literature, with the largest differences during the night (Rovers, Bosch and Albers, 2014). A recent study, *Climate Proof Cities for the Netherlands* (Rovers, Bosch and Albers, 2014), reports maximum UHI intensities of Dutch cities between 3°C and more than 7°C. Klok et al. (2012) found that, during a hot period in 2006, in the 73 largest cities in the Netherlands, the surface day-temperature is on average 2.9°C higher than in the surrounding rural area, and during the night the difference is 2.4°C. Giridharan and Kolokotroni (2009) studied the UHI effect in London during the winter period. The maximum UHI effect was 9°C in the core area. Their findings of summer and winter research suggest that winter UHI effect is largely a macro- or regional-level phenomenon, while summer UHI effect is largely a micro-level phenomenon.

Increased temperatures in cities can inhibit photosynthesis and decrease crop yields. Also, vapour pressure deficits can be high in urban areas, causing plants to use more water. This could lead to increased moisture stress and decreased photosynthesis (Arnfield, 2003; Schneider, 2013).

The emission of heat by industry, households, buildings, traffic, humans and animals represents an important share of the UHI effect: ca. 10% was reported for the city of Rotterdam (Rovers, Bosch and Albers, 2014). The fractions of built-up and paved surfaces and the fraction of green, evapo-transpiring surfaces are the most determining factors for the spatial variation of the UHI effect within urban areas (Rovers, Bosch and Albers, 2014). Klok et al. (2012) report that a decrease of sealed urban surface leads to a reduction of the surface heat island effect of 1.2°C during the night and 2.0°C during the day. A study in Rotterdam showed that from a set of 9 measures, trees have the strongest cooling effect on day temperature on a hot day, with on average 1.2°C reduction of the temperature during the hottest moment (Klok et al., 2012). Zhou and Marshall Shepherd (2009) modelled possible UHI mitigation measures (greening and/or increasing surface albedo) in Atlanta. Doubling the shade factor and evapo-transpiration resulted in a reduction of the maximum temperature by 7°C. Increasing albedo by a factor of three resulted in a reduction of only 1–2°C. Corburn (2009) studied three measures to mitigate the UHI effect: planting trees in open spaces or along streets, blanketing rooftops with vegetation (living roofs/green roofs) and increasing the reflectivity of built surfaces. The input from local planners was used to

determine which measures could fit in different areas in the city. According to local stakeholders, the planting of street trees was a more favourable option than increasing the albedo.

Urban farming can increase the vegetation cover in and around cities (Figure 3.5) if it replaces a 'grey' land-cover type, and can provide a cooling mechanism by increasing evapo-transpiration. It can therefore help to reduce the UHI effect during the growing season. An important requirement for the cooling effect from green spaces provided by urban agriculture is the availability of water (Eriksen-Hamel and Danso, 2010; Rovers, Bosch and Albers, 2014).

Figure 3.5 Green, evapo-transpiring surfaces around urban areas



Climate benefits

- 'Open air' forms of urban agriculture can reduce the urban heat island effect by reducing the area of paved surface, and by providing a cooling mechanism through increased evapotranspiration.
- As a result, GHG emissions from fossil fuel use for air conditioning and ventilation can be reduced.

Business opportunities

- Smart siting of farms in urban centres can be used in city planning to generate economic benefits from avoided costs for health damage from heat stress.

3.2 Environmental challenges related to urban agriculture

Planning to grow urban food places leads to essential questions about soil, water, terrain, and climate. How does nature work here? What will enhance the health of the soil? How might the built environment become productive and photosynthetic, harvesting more water, energy and nutrients than it consumes? (McDonough, 2014)

The urban environment offers various resources for urban agriculture in the form of soils, water, space, atmosphere and energy carried by radiative heat and solar radiation. At the same time, there are environmental growth-limiting or -reducing factors that affect production in urban and peri-urban agriculture, such as the pollution of soil, water and atmosphere or shade from buildings or even trees (Eriksen-Hamel and Danso, 2010; Wortman and Lovell, 2013). The availability of water for urban agriculture, nutrients from organic waste streams, wastewater and residual heat have already been briefly discussed in previous sections. Further issues, presented in the following sections, may be relevant to identify business models for urban food enterprises. There is a huge literature on each of these topics. We do not pretend to give a complete overview of the available knowledge and ongoing initiatives. Websites with more in-depth information on the topic are listed at the end of the report.

3.2.1 Soil contamination

Soils, water and the atmosphere in urban areas may carry contaminants from past land uses, emissions from industry and traffic, or air deposition, which may be harmful to human health. There are many potential soil contaminants (e.g. lead, arsenic, mercury, cadmium and polycyclic aromatic hydrocarbons). Lead (Pb) is the most often studied contaminant due to the elevated concentrations and its correlation to other urban contaminants (Wortman and Lovell, 2013). Soil concentrations of lead in a natural soil are typically near 20 Mg kg⁻¹, whereas a heavily contaminated urban soil may contain concentrations near 2000 Mg kg⁻¹. The elevated concentrations of lead and other contaminants are due to waste incineration, coal and oil combustion, and the use of leaded gasoline and paints (Wortman and Lovell, 2013). Mitchell et al. (2014) analysed heavy metal concentrations in soils from 54 community gardens in New York City, and found that in most gardens (78%), health-based guidelines were not exceeded. Experimental studies on soil contamination with lead and the uptake by vegetable crops in urban gardens in the Netherlands and the United States showed that lead contents in the vegetable crops were below health-based thresholds for exposure (Romkens and Rietra, 2010; Wortman and Lovell, 2013).

The use of organic waste in urban crop production may also cause contamination of urban soils and water resources. Urban organic waste can reach soils used for agriculture in various forms (Cofie, Adam-Bradford and Drechsel, 2009; Meuser, 2010):

- by the use of fresh waste from vegetable markets, restaurants and hotels, as well as food processing industries as feed for urban livestock
- direct application of solid waste on and into the soil
- mining of old waste dumps for application as fertiliser on farmland
- application of animal manure such as poultry/pig manure and cow dung
- direct application of human excreta or bio-solids to the soil
- organised composting of solid waste or co-composting of solid waste with animal manure or human excreta

In a study by Mitchell et al. (2014), contaminants were associated with visible debris and a lack of raised beds. Metals in compost derived from municipal waste may come from many sources: batteries, consumer electronics, ceramics, light bulbs, house dust, paint chips, used motor oils, plastics, and some inks and glass. High concentrations of these elements may impede plant growth, but the greatest concern is through their potential to directly harm children and animals through direct ingestion, to harm soil organisms, or to enter the food chain (Cofie, Adam-Bradford and Drechsel, 2009).

There are several practices to reduce the potential for gardening-related exposure to soil contaminants ('healthy gardening practices'), such as gardening in raised beds, importing clean soil and compost for bed establishment, phytoremediation¹ and maintaining the soil pH at levels that minimise plant uptake of heavy metals (Romkens and Rietra, 2010)². Sheltered production methods have been used in urban agriculture to avoid contact with the soil and air in contaminated areas (e.g. greenhouses, indoor production, hydroponic growing mediums, etc.) (UrbanDesignLab, 2012). Also, the growing of non-food crops in sites in cities that are heavily contaminated may relieve some of the concerns for exposure to contaminants from air, soil and water resources. Such crops may include, for example, aromatic and medicinal herbs, flowers, fibre crops and biomaterials, or biofuels (UrbanDesignLab, 2012).

¹ For cleaning up soils contaminated with cadmium, zinc and copper; of limited value for lead.

² www.clu-in.org/ecotools/urbangardens.cfm

Environmental challenges

- Soils in urban areas with a commercial or industrial history may contain contaminants that can pose health risks when the soils are used for agriculture. Yet in many cases, health-based thresholds for human exposure are not exceeded.
- The use of organic waste in urban agriculture may be another source of contamination of water and soil resources in urban areas.

Business opportunities

- Non-food horticulture by UFEs in contaminated sites could offer a value proposition to city governments as part of phytoremediation strategies and solutions for the storage and buffering of contaminated storm-water run-off.

3.2.2 Soil health

The capacity of urban soils to provide sustainable and safe food production can be judged from the soil health condition in urban areas. Soil health is defined here as a state of composite quality of biological, chemical and physical properties of the soil as they relate to crop productivity (following Knight et al., 2013). Studies in the United States have shown that urban development is taking place on the most fertile and productive land (Imhoff et al., 2004; Nizeyimana et al., 2001). Yet there are often concerns about the poor conditions of urban soils for food production. The reasons are: lower plant nutrient and organic matter content; a lack of structural and functional complexity of the food web; potential contamination due to previous commercial and industrial use (see section 3.2.1); and low aeration, porosity and drainage due to compaction by heavy construction equipment (Cheng and Grewal, 2009; EPA, 2011). Based on field experiments in vacant lots in Cleveland, Ohio, Knight et al. (2013) concluded that properties such as active carbon, microbial biomass nitrogen, various nematode community parameters, clay content and soil organic matter have potential for predicting the quality of urban soils for crop productivity.

Soil organic matter is essential for land-based urban agriculture, since it provides nutrients to crops and feedstock, and enhances soil moisture retention. The amount of soil organic carbon (SOC) stored in urban soils is highly variable in space and time, and depends among other things on soil parent material and land use (Lorenz and Lal, 2009). It will also vary based on the type of vegetative cover, maintenance history and, for new developments, regulations and practices for topsoil restoration (Brown, Miltner and Cogger, 2012). Some studies on carbon stocks in urban soils use an environmental gradient approach from urban

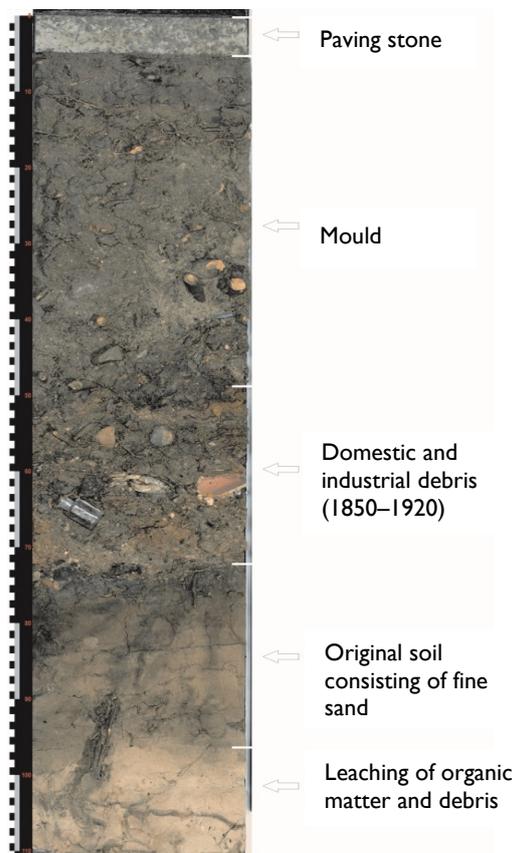
centres outwards, in the context of urban sprawl. In general, these studies found increased carbon pools in urban soils compared to rural areas, due to more intensive management (increased water and nutrient input) and direct impacts of proximity to urban areas, including higher temperatures and increased nitrogen deposition (Brown, Miltner and Cogger, 2012).

Lorenz and Lal (2009) report values for the SOC pool in urban soils ranging between 16 and 232 Mg ha⁻¹ up to 0.3 m depth, and between 15 and 285 Mg ha⁻¹ at 1 m depth.

Edmondson et al. (2014) found an average SOC storage of 99 Mg ha⁻¹ (to 20 cm depth) in green spaces of domestic gardens and non-domestic green spaces across a typical mid-sized UK city (Leicester, 73 km², 56% green space) – a value comparable to the SOC storage of arable land around the city. The largest SOC stocks were found in domestic gardens with trees. For comparison, SOC stocks in European agricultural soils, as estimated from a recent pan-European assessment with the CENTURY model (Lugato et al., 2014, in Morari, Panagos and Bampa, 2015), range from lower than 40 Mg ha⁻¹ in the Mediterranean region to between 80 and 250 Mg ha⁻¹ in north-eastern Europe. According to this model assessment, hotspot locations of SOC include agricultural peat soils in northern Europe, with values >250 Mg ha⁻¹.

Improving soil health for agricultural use in urban areas may be more demanding than for other types of use in order to achieve the specific characteristics needed to grow certain crops. EPA (2011) distinguishes physical, chemical and biological reconditioning, to be performed in that order. Physical reconditioning of urban soils aims at improving drainage characteristics and soil structure, and mitigating compaction. An example is the raking out of debris often accumulated in urban soils (Figure 3.6). All are important for urban agriculture, e.g. for enabling root penetration and water-holding capacity. Chemical and biological soil reconditioning techniques to make urban soils suitable for agriculture include adding compost and tilling, altering the soil chemistry to achieve desired parameters (e.g. pH), and manipulating soil organism populations (EPA, 2011). The supply of organic waste (as compost) in urban agriculture can lead to surpluses in nitrogen and phosphorus (Khai et al., 2007, in Eriksen-Hamel and Danso, 2010; Wang et al., 2008). This can cause environmental problems to surface and groundwater in urban areas, but is usually not a constraint to crop production. However, as already mentioned, in cases where the organic waste is of a limited variety, amendments may lack potassium or micro-nutrients. In these cases there is a need for urban farmers to develop balanced nutrient management plans (Eriksen-Hamel and Danso, 2010).

Figure 3.6 Soil profile in the Liebergen neighbourhood in the city of Hilversum, the Netherlands



(Source: Stephan Mantel, ISRIC World Soil Information)

Environmental challenges

- Identifying 'healthy soils' for agriculture in urban areas. Soil health for urban agriculture can be inferred from measurable soil properties, and improved by soil reconditioning techniques.
- Optimising the spatial allocation of urban farms in places with high inherent soil nutrient stocks. Organic matter and carbon contents of urban soils are highly variable in space and time, and not necessarily lower than in surrounding rural land.

Business opportunities

- The urban environment may offer locally available moisture and soil amendments, such as composted food scraps, manure, approved bio-solids, and lawn-based mulches that can be used to improve soil quality, fertility and tilth – and hence, the agricultural production capacity of urban soils.
- The use of municipal waste products to improve soil health can reduce processing and transport costs associated with disposal. This may offer a value proposition to urban agriculturalists as buyers of municipal waste.

3.2.3 Solar radiation

Some urban areas are reported in the literature to receive less solar radiation than rural areas due to the increased reflectance of radiation away from the ground, as a result of increases in air pollutants and aerosols over urban areas (Alpert and Kishcha, 2008, in: Eriksen-Hamel and Danso, 2010). However, the impacts of solar dimming on the potential production of crops in urban areas are difficult to predict. The reflection of short-wave radiation from buildings and paved surfaces creates heat loads, hindering the photosynthesis of plants (Schneider, 2013), and depletes soil moisture compared to situations where only direct, incoming irradiance is measured (Eriksen-Hamel and Danso, 2010).

Shade from buildings (causing decreased solar radiation on plants) is likely to reduce plant productivity if radiative heat load is also low, as in wet humid climates (Wang et al., 1994, in Eriksen-Hamel and Danso, 2010). Possible remedies to reduced direct solar radiation in cities include shade-adapted plants, sunny locations (Figure 3.7) or locations with artificial light (e.g. office buildings), or targeted nutrition. Solutions to decrease the requirement of artificial lighting in vertical farming include adapted building designs to optimise solar irradiation, or VertiCrop systems that use moving conveyors to expose plants to either

natural or artificial light (www.verticrop.com). Examples include the VertiCrop system to grow lettuce crops for animals at Paignton Zoo in Devon, England³. Another example is Philips' City Farming, a technique to perform multilayer farming in closed, climate-controlled cells⁴.

Figure 3.7 Sunny spaces in the city



(Source: dakengevelgroen.nl)

Environmental challenges

- Reduced direct solar radiation at locations in urban areas may reduce plant productivity.
- Reflection of solar radiation from buildings and paved surfaces also negatively influences plant growth due to increased heat loads.

Business opportunities

- Using climate-controlled multilayer cultivation and artificial lighting (e.g. LED lighting) offers the possibility to reduce costs, increase production and grow more efficiently.

3.2.4 Production space

One of the motives for urban and peri-urban agriculture is to provide sufficient food for the increasing human population in urban centres, realising that the availability of suitable land for land-based agriculture outside cities is decreasing (FAO, 2015; Lin, 2014; McBratney, Field and Koch, 2014). Urban areas offer space for food production on rooftops, in vacant lots, in vacant buildings and underground. Apart from the space provided, the proximity of technology and knowledge in cities supports high-tech forms of urban agriculture, and the proximity to customers reduces the amount of food miles 'from farm to floor'. Another advantage is the proximity of water and energy sources (see earlier). An example of a

³ <http://www.biaza.org.uk/plant-care-management/awards-and-commendations/verticrop/>

⁴ http://www.lighting.philips.com/main/application_areas/horticultural/cityfarming/philips-city-farming.wpd

commercial rooftop farm is the LokDepot aquaponics farm in Basel, Switzerland, where fish and vegetables are grown, while the waste from the fish is used to feed the plants, and the plants are used to clean the water for the fish⁵.

Vacant lots in urban areas often suffer from bad soil or climatic conditions as explained in previous sections. Skyfarming or vertical farming – i.e. farming in storeys in (existing or designed) buildings or greenhouses – is promoted as a solution to overcome constraints of environmental conditions in urban areas, since it would be largely environment independent (Despommier, 2011; Germer et al., 2011). High-tech vertical farming includes the growth of crops (mostly horticultural), fish and cattle in multi-storey buildings in urban areas, using new technologies such as rotating crop beds and power LED lightning (Oskam, Lange and Thissen, 2013). There are some examples of vertical farms (see www.verticalfarm.com), but most are in the conceptual stage. Examples from the Netherlands are the growth cabinets in office farm De Schilde (The Hague) and De Zuidkas, an imaginary office building of over 11,000 m² on the Zuidas tangent in Amsterdam (www.dezuidkas.nl/en).

Underground farming is another option to exploit space in urban areas, by cultivating food in underground spaces or containers. The farm systems are usually hydroponics, aeroponics or air-ponics. Growth lamps or day lighting systems (tubes) provide light. An example is the Growing Underground project, a hydroponic farm beneath the London Underground's Northern Line, in a network of tunnels that were originally built as air-raid shelters during the Second World War (<http://growing-underground.com>).

Environmental challenges

- Production space for agriculture in urban areas is small and scattered compared to peri-urban and rural areas, but becomes more interesting now that the latter are unlikely to meet the demand for agricultural products in the future.

Business opportunities

- The proximity of technology and knowledge to urban agricultural enterprises supports high-tech forms of urban agriculture.

⁵ <http://sustainablecitiescollective.com/david-thorpe/426096/worlds-first-commercial-rooftop-aquaponics-farm>

4 Policy and governance

4.1 Food touches all, framed by none

As outlined earlier in this report, food touches upon a multitude of different policy areas including health, education, economic development, transport, climate change and environmental conservation. The capacity of food systems to simultaneously impact upon several priority non-food related policy areas, such as economic development, health and well-being and GHG emissions, can have the inverse effect of creating a ‘governance trap’ whereby the higher the number of interested parties, the greater the failure for any one individual community group or organisation to take up the food agenda as a means to addressing wider social issues, including but not limited to food poverty, obesity, and the barriers to food access and choice over nutritious quality food and its causes. Avoiding this governance trap will require the modelling of complex policy interrelationships, with particular attention to the baseline work of food policy councils, food partnerships, and subsequent strategies and action plans. Indeed Morgan argues that ‘among the basic essentials for life — air, water, shelter and food — planners have traditionally addressed them all with the conspicuous exception of food’ (2009: 341).

Food is connected with a wide range of municipal and regional policy areas: from land-use planning to infrastructure and transport, environmental conservation, housing and economic development. Food, then, can be a vehicle to integrate the economic, social and environmental dimensions of sustainability, as well as for addressing justice and health issues at different geographies and scales, including cities.

(Moragues et al., 2013, p. 4)

This is a strategic planning challenge, the success of which is pre-conditioned on European regional cross-border planning and policy coordination in association with international initiatives such as the Milano Urban Food Policy Pact.

On a European level, the momentum of such efforts requires concerted attention to policy developments, and related funding mechanisms under Directorate General for Agriculture and Rural Development (DG AGRI), namely the Common Agricultural Policy (CAP), and Directorate General for Regional and Urban Policy (DG REGIO). The above considerations of food (agriculture) in the context of wider urban and regional development objectives, and European spatial planning, requires urgent territorial impact assessments of one set of policy

mechanisms on the other. If city-regional food systems are to be advocated in Europe, the urban–rural divide that is evidenced in the *spatial distribution* of Common Agriculture Policy (CAP) subsidies must be re-framed and better coordinated with European urban and regional development objectives/funding mechanisms. Moreover, minimum *spatial thresholds* for direct payments to farmers may exclude producers with smallholdings, and their associated UFE networks, from needed funding. This can further impede the inclusion of UFEs in city-regional food systems. Whereas the minimum threshold is 5 hectares for the UK (*avg. holding: 54 hectares*), it is 2 hectares for the Netherlands (*avg. holding: 25 hectares*) (EC 2013).

At the city-regional level, attention to the complex interconnections between food systems and other urban systems, such as (food) waste to energy and/or composting streams, will be required of urban planners. The business case that underpins this call for cross-border, inter-sectoral synergies is one of circular economies and ecosystems services. It is a business case that must equally take into consideration pre-existing issues surrounding the uneven distribution of ecological assets (and their social returns), and the disproportionate environmental burdens among economically disadvantaged urban residents.

Altogether, an attention to these complex policy interrelationships, not to mention health policy, is as much about the business case of fusing urban-economic growth to the mitigation of climate change or abandoning social practices that accelerate it, as it is the regional supply of quality food through coordinated policy interventions and public procurement as well as urban residents' access and financial capacity to purchase these foodstuffs. Table 4.1 (following page) outlines several policy barriers, albeit not restricted to urban-regional policies, and opportunities for coordinated policy development. The outline is structured on the principal stages of a food cycle (Figure 1.1): inputs, production, processing, distribution, access, consumption and resource recovery.

Table 4.1 UK and NL policy barriers and opportunities throughout the food cycle

Food system stages	Barriers	Policy opportunities
Inputs	Lack of access to finance – often few assets to borrow against – banks reluctant to offer micro-loans	Make finance available for start-ups without requiring assets to borrow against as this can discourage communities from the outset
		Raise awareness of finance that is available to such groups, e.g. Triodos Bank
		Encourage traditional banks to increase availability of micro-loans to micro SMEs at competitive rates
		Identify novel forms of funding such as crowd sourcing, which can offer alternatives to traditional funding routes
		Enable funding to reach UFEs through better communication with regional development actors, identifying synergies with rural development funding to micro enterprise via LEADER
	Lack of access to land due to land-use policies and rising real estate prices in inner-city areas, and increasingly in peri-urban areas under the pressures of urban growth and other 'legitimate' competing uses of land, namely housing	Relax change of use and contaminated land laws for UFEs
		Local authorities should provide information on council-owned vacant lots and temporary lots, working with state departments and other authorities to compile local authority land holdings.
		Encourage public- and private-sector actors to allow UFEs to use available land, highlighting positives for them, e.g. corporate social responsibility
		Offer discounted rents for premises of UFEs
		Provide information on alternative forms of growing that do not need soil – e.g. temporary growing spaces on hardstandings, raised beds, and hydroponic or aquaponic farming
		Designate, protect and integrate or set aside land (especially most fertile, productive land) for agricultural production in peri-urban areas with an attention to developing integrated city-regional food systems/economies, including homes for workers
		Reinforce the resilience and ecosystem services on green infrastructure systems by designating these spaces for agricultural production by small-holder farmers, 'urban' farmers and civic groups
Production	Lack of skills/knowledge of farming	Provide educational courses for urban farming
		Address the cultural barrier that sees no space for farming within the city. Who is the future farmer? There is a need for low-skilled jobs in Western European economies. Introduce urban farming to the wider debate about the rebalancing of the global economy and the need for lower skilled jobs in Western nations and food security

Food system stages	Barriers	Policy opportunities
Production	Lack of skills/knowledge of farming	An ideological or economically driven assumption that future farms need to be larger and driven by economies of scale, not necessarily quality and values of produce, accompanies this cultural barrier. Smaller farms consequently are not seen as viable, desirable, or economic, which can be exacerbated by minimum spatial thresholds that may exclude producers with smallholdings from direct payments under the Common Agricultural Policy (CAP)
	Buyers reluctant to deal with multiple small-scale producers	Encourage the creation of collaborative marketing and selling schemes for small-scale producers
		Support producer co-ops to exploit economies of scale Provide alternative channels-to-market to those of the conventional food system, such as the Food Assembly, and policy support for farmers markets and food hubs. National planning policy is relatively weak in this regard because of its direct association to food. Though non-food outcomes in economic development, for example, can be attained through such policy interventions
	Cost of organic certification	Reduce cost, time and frequency of organic certification process for small producers
Processing	Lack of enterprises focused specifically on small-scale local processing	Support the installation of more small-scale processing units/portable units so that local food can remain local rather than transported long distances due to lack of local processing facilities. In England, Food Enterprise Zones – through financial support from Defra – appear to be more directed at simplifying development-planning requirements; whilst food processing has been concentrated in one area, others are dispersed at producer sites under this programme. Yet there remains scope within Rural Development Regulation to support quality and short supply chains.
	Food standards and sanitary and phytosanitary standards	
	Laws against on-site processing	Investigate options for loosening restrictions on on-site processing where appropriate
Distribution	Difficult for small producers to compete with the economies of scale of larger corporates, particularly supermarkets	Support smaller distribution businesses focused upon final mile delivery, e.g. Food Logica (Amsterdam)
		Reward those producers/processers who can demonstrate short supply chains to customers, e.g. Zero Carbon Food (London), as they reduce the strain upon infrastructure such as roads, ports and airports. The burden of air pollution, breaches in EU regulations and standards, as well as congestion is increasingly salient
		Encourage uptake of schemes that aggregate produce providing convenience for small producers and consumers (e.g. Food Assembly, farm drop)

Food system stages	Barriers	Policy opportunities
Access	Start-up costs of kitchens, shops, equipment and markets	Offer Adjust planning laws to simplify change of use of commercial buildings for food retailers and restaurateurs. Careful attention must be given to this changeover to ensure food is brought back into town and city centres, increasing market outlets for local producers and processors access to kitchen preparation spaces, trading opportunities and markets e.g. Kitchenette (London)
	Lack of knowledge of food industry for would-be entrepreneurs	Training in the workings of the food industry. Introduce new, and support existing, business mentor schemes
	Costs and complexities of meeting food regulations	Relax and/or reduce costs of meeting food hygiene standards and health and safety regulations for small businesses for whom costs are disproportionately high and standards often unnecessarily strict. Regulations also should be evaluated by small business stakeholders at the earliest stages of their formulation or review
	Public sector food procurement by hospitals, schools, prisons, home care services etc.	Use food quality, environmental impact, and fair wages among others to obtain best value for public money. Identify powers of purchase by local authorities that can help to deliver non-food areas of statutory obligation such as health and economic development
	Affordability of local, organic food for low earners and those receiving support from the state and/or food banks	Advocate a fair or living wage Address zero-hour contracts Provide subsidies for local food for low earners; USA has examples of voucher schemes for food provision from local food markets for those on low incomes, which could boost healthiness of diets and increase affordability (assuming less processed food is cheaper than processed)
Consumption	Lack of knowledge among consumers about the benefits to their city-regional economy	Highlight the benefits for city-regional economies of purchasing from local shops rather than corporates, such as supermarkets
	Insufficient cooking skills among consumers	Greater emphasis upon cooking skills in schools, academies and colleges
	Lack of knowledge of local food	Collaborative promotion/marketing strategies – ‘Food Weeks’, celebrity endorsements, and collaborative markets
	Lack of concern among consumers about story behind the food	Pursue alternative means of marketing organic food that do not rely upon the ‘quality’ and ‘ethicacy’ narratives.
	Cosmetic food standards	Challenge current cosmetic policies of retailers Educate consumers regarding the cosmetic appearance of food
Resources recovery	Lack of integration between food (namely waste and processing), energy and water systems in city-regions	Tie the sustainable economic development principles of a ‘circular economy’ and related ecosystems services to inter/intra-urban blue–green infrastructure provision

Food system stages	Barriers	Policy opportunities
All of the above	Market concentration	Adjust competition laws to prevent monopolisation by large agri-business, increasing overall retail diversity
	Knowledge: technical and business	Increase access to technical training, education and extension services for producers.
		Provision of business mentors for UFEs
		Strengthen links between private sector and city-regional food systems.
	No economic reflection of environmental good provided by UFEs	Encourage partnership through community supported agriculture (CSA) schemes.
	Food is too important to be nominally a DG AGRI or national agricultural policy concern	Address rural and urban inequalities in territorial development, food access and health, i.e. food security as well as nutrition security
	An urban–rural divide that is evidenced in the spatial distribution of CAP subsidies	Re-frame and better coordinate European urban and regional development objectives and funding mechanisms between DG AGRI and DG REGIO
Lack of modelling of complex policy interrelationships, especially at the nexus of energy, water and food	Encourage coordination of existing data collection across relevant sectors, or inter-sectoral platforms	
	Identify policy levers that reinforce city-regional economies that complement urban systems, e.g. waste-energy streams	

Everyday food practices, at all stages of the food cycle, are increasingly being challenged as actors from a variety of disciplines attempt to rethink and reshape food systems along more ethical, socio-ecologically positive lines. If local food systems are to play a central role in any such transformation, greater efforts will have to be made to support their growth. This will necessitate greater levels of horizontal cooperation between different governmental departments, at local and national levels, and NGOs, as well as increased vertical cooperation between different levels of government, all the way up to challenging many of the international trade laws that serve to monopolise the global food industry. This in turn necessitates the development of more food ministries and food councils charged with governing this collaborative cross-cutting approach between government, civil society and the private sector.

As outlined earlier, many of the actors involved in local food systems (particularly UFEs) are not willing to compromise on the ideological motives that inform their businesses. Indeed, for them to do so would mean that all interested parties lose out because the services that UFEs offer to society, such as community support, local jobs and skills upgrading, would be lost. As such, any policies aimed at supporting the growth of the sector must not have the adverse effect of squeezing out these ancillary services. A key goal for many local food networks is to improve access of quality nutritious food at prices that reflect fair wages; this also negates calls for urban food enterprises to solely target premium markets.

5 The current landscape of city-regional food systems in a global city, a regional town centre and a polycentric ‘garden city’

To attempt to produce a typology of UFEs constitutes a precarious undertaking. UFE practices intersect and/or overlap with one or more stages of the food cycle (Figure 1.1). Its associated practices and activities would require a strict framework of typologies, which is both detrimental conceptually and cumbersome when applied to real-life examples. This in turn points to some of the real-life challenges UFEs face when trying to: (i) establish their own identity; (ii) distinguish themselves from the other actors operating within the many arenas that they inhabit; and (iii) convey this identity to consumers and other actors with whom they interact. That said, the project case studies have been selected for their unique urban characteristics – as a global city (London), a regional town centre (Reading), and polycentric ‘garden city’ (Almere).

5.1 A typology of UFEs in London, Reading (UK) and Almere (NL)

Considering the complex landscape within which UFEs interact and overlap with different stages of the food cycle, we begin by observing the activities that different UFEs undertake, and how they subsequently identify themselves within their different arenas of practice. By drawing upon these practices and the subsequent terms used by UFEs to identify themselves, Table 5.1 provides an extensive overview of the different types of UFEs currently operating within the report’s case study cities.

Table 5.1 Typology of UFEs in London/Reading (UK) and Almere (NL)

Type	Description	Case (UK)	Case (NL)
City farm	Inner-city land devoted to agricultural production including livestock, crops and fish	Stepney City Farm	Urban Farm Almere
Peri-urban farm	Land devoted to agricultural production including livestock, crops and fish located in the peri-urban area of a city-region	Sutton Community Farm	Zonnehoeve
Hydro-aquaponic farm	Farm utilising closed-system hydroponic and/or aquaponic processes of production	GrowUp	n/a
Community supported agriculture	Alternative economic model for agriculture where local community and farmer share financial risks of food production	Growing Communities	Orchard Hof van Almere
Wholesale	Sale of produce to other organisations	Field to Fork Organics	De Natuurwinkel
Food processors	Transformation of raw ingredients by environmentally benign means into food products	Global Generation	Meal factory De Kroes
Transport systems	Transportation of locally produced raw and processed produce using energy-efficient systems	Food Logica	n/a
Farm shop/farm gate sales	Sale of produce directly from producer to consumer at location of production	Hackney City Farm	Efibia De Buitenplaats
Drop scheme	Receives customer order; collects or receives produce from producer and/or produces own; divides produce into orders; makes orders available for collection at designated collection point	Food Assembly	Regelrecht van de Boer
Box scheme	Receives customer order; collects or receives produce from producer and/or produces own; divides produce into orders; delivers order to address of customer's choosing	OrganicLea	Hofwebwinkel
Community/independent/village shop	Independent shop operating as a social enterprise to maximise positive socio-ecological outcomes for the wider community	True Food Coop	Care farm Weet hoe je leeft

Table 5.1 Typology of UFEs in London/Reading (UK) and Almere (NL) (cont.)

Type	Description	Case (UK)	Case (NL)
Market	Local food markets run as social enterprises for traders who reflect UFE model	Stoke Newington Farmers Market	Farmers market Almere
Food cooperative	Non-profit community business that is owned and managed by those who use its services	True Food Coop	VOKO Almere
Food hub	Involves at least one of the collective: purchase, production, aggregation, processing and distribution of foods	Growing Gardens/Deen City Farm	n/a
Food bank	Provision of produce, often non-perishable, offered free of charge to those in need	Trussell Trust	Food Bank Almere
Restaurant/cafe	Non-profit community business serving local food and beverages	RISC	Het Eksternest Tante Truus
Food as medium for other outcomes	Non-profit community enterprise using locally produced food as a medium to achieve wider socio-ecological outcomes, e.g. educational services, youth programmes and work experience	Global Generation	ONZE
Incubator	Business, finance and training support for new entrants into AFNs	Growing Communities	Development Centre for Urban Farming Almere Association Buitenstad

It is important to recognise that the types of operations a food business undertakes do not intrinsically distinguish it as being a UFE. For example, a box scheme could be run on a non-cooperative basis, aimed at producing profit for shareholders, with organically- or non-organically-produced goods sourced as a means of reducing costs and increasing profit. To assume the term 'box scheme' refers to a type of UFE would therefore be a misapplication of the term. Box schemes aggregate produce, package it into customer orders and deliver to each customer's address of choice. These processes can be carried out in a variety of ways, with contrasting positive and negative socio-ecological outcomes. Additionally, some actors may strive to secure positive socio-ecological outcomes, yet consciously or unconsciously fail to achieve these within their operations. As such, it is the precise modes of practice employed by these organisations when undertaking their operations that ultimately dictate their identity as a UFE.

Having given credence to these obvious ambiguities, it should also be acknowledged that the term ‘box scheme’ has reasonably come to signify many of the positive socio-ecological attributes commonly sought by UFEs. In keeping with this approach, Figure 5.1 seeks to offer a distinction between those terms that have reasonably come to represent a UFE (red), and those that have not (green). In the cases of those that have not, this is often because the terms used are commonly applied in more conventional contexts, or they are too general to be considered as classifications of UFEs.

Figure 5.1 Ambiguity of UFE classification



Having established some of the complexities involved in categorising types of UFEs, it is also important to acknowledge that many UFEs consider themselves to incorporate a number of the above types. For example, Growing Communities, based in Hackney, North London, could rightly be described as a drop scheme, box scheme, city farm, market, incubator and cooperative, as it builds facets of each of these typologies into its business model. Such typologies can therefore prove highly restrictive when applied to real-life cases. With this in mind Tables 5.2 and 5.3 seek to capture this complexity by illustrating the different activities and subsequent types incorporated within the organisational model of eight UFEs based in London, UK, and 16 based in the Netherlands. It demonstrates the manner in which many UFEs incorporate several of the above typologies within their business model and often possess multiple revenue streams as a consequence.

Table 5.2 Typology of Urban Food Enterprises in London/Reading (UK)

	CSA scheme]	Grower	City farm	Peril urban farm	Hydro/aquaponic farm	Roof farm	Source from other producers	Food processing	Wholesaler	Box scheme	Drop scheme – pick up point	Farm shop	Food Co-op	Café/restaurant	Market in own right	Market stall at community markets	Independent shop	Online shop	Supplies restaurant/café	Provide pathways to employment	Youth services	Educational services	Cooking courses	Horticulture related courses	Sell plants	Sell compost	Consultancy services	Corporate CSR activities	Provide incubator services	Organic principles	Process own waste
Global Generation		X	X					X					X							X	X	X	X	X			X	X		X	
Food Assembly							X				X							X												X	
Cultivate London		X	X																	X	X	X		X						X	
Growing Communities		X	X				X			X	X		X		X	X				X	X			X			X		X	X	
Organic Lea		X		X			X			X		X			X				X	X	X	X			X	X				X	
Field to Fork Organics							X		X		X	X							X		X	X								X	
Sutton Community Farm		X		X						X	X													X					X	X	
Farm Drop							X			X	X							X												X	

Table 5.3. Typology of Urban Food Enterprises in Almere (NL)

	CSA scheme	Grower	City farm	Peri-urban farm	Hydro/aquaponic farm	Roof farm	Source from other producers	Food processing	Wholesaler	Box scheme	Drop scheme – pick up point	Farm shop	Food Co-op			Market stall at community markets	Independent shop	Online shop	Supplies restaurant/café	Provide pathways to employment	Youth services	Educational services	Cooking courses	Horticulture related courses	Sell plants	Sell compost	Consultancy services	Corporate CSR activities	Provide incubator services	Organic principles	Process own waste
Regelrecht van de Boer		X					X				X	X												X						X	
Hofwebwinkel							X		X		X							X	X											X	
Care Farm Weet hoe je leeft		X										X							X	X					X						
Urban farm Almere		X	X					X				X	X		X	X			X	X		X	X	X						X	
Zonnehoeve				X				X				X					X		X	X										X	
Meal factory De Kroes								X											X												
Farmers market Almere									X						X															X	
De Natuurwinkel									X							X														X	

Table 5.3 Typology of Urban Food Enterprises in Almere (NL) (cont.)

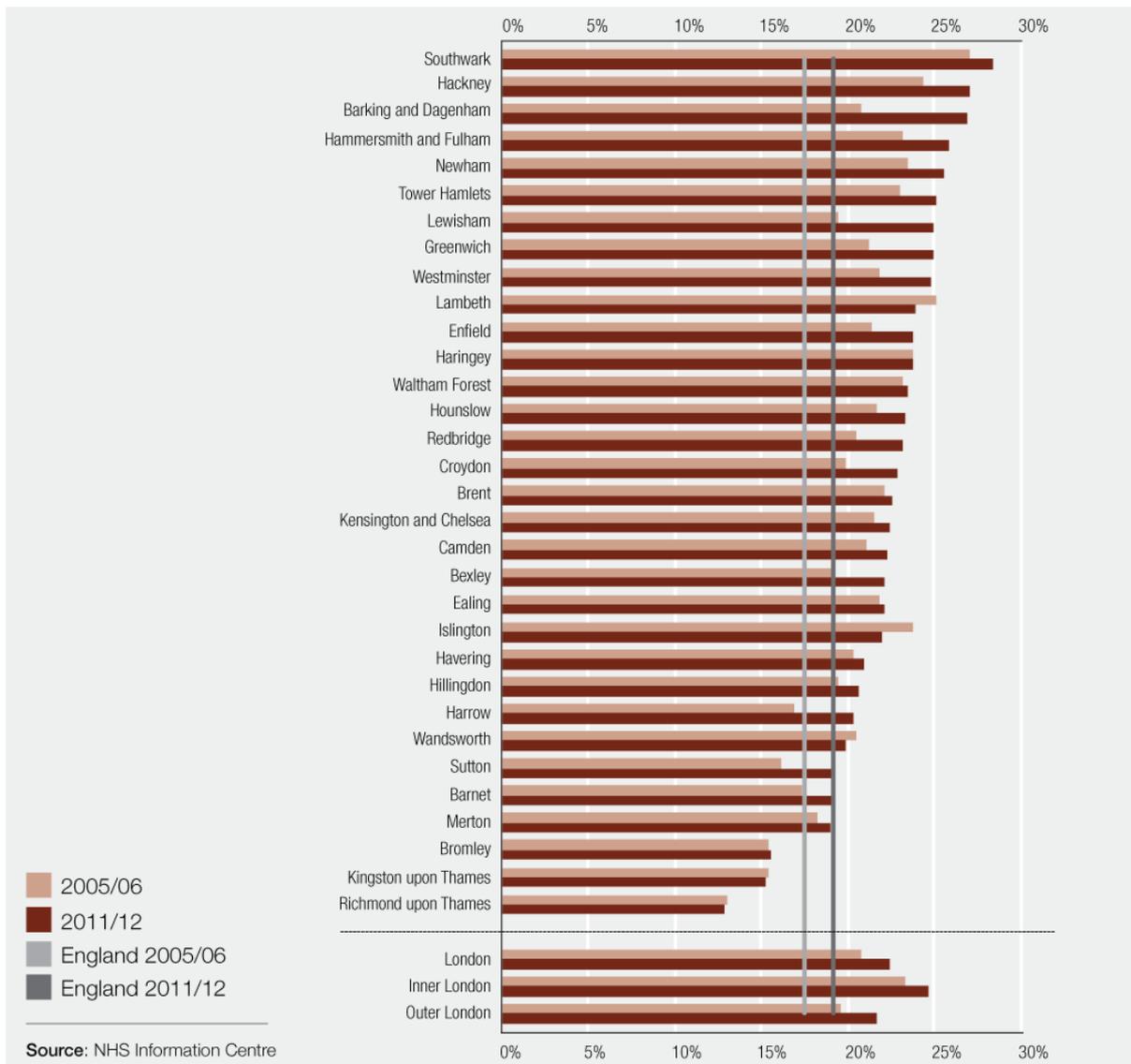
	CSA scheme	Grower	City farm	Peri-urban farm	Hydro/aquaponic farm	Roof farm	Source from other producers	Food processing	Wholesaler	Box scheme	Drop scheme – pick up point	Farm shop	Food Co-op	Café/restaurant	Market in own right	Market stall at community markets	Independent shop	Online shop	Supplies restaurant/café	Provide pathways to employment	Youth services	Educational services	Cooking courses	Horticulture-related courses	Sell plants	Sell compost	Consultancy services	Corporate CSR activities	Provide incubator services	Organic principles	Process own waste
VOKO Almere											X	X																		X	
Efibia		X					X					X				X						X								X	
De Buitenplaats		X	X												X							X								X	
Food bank Almere		X																		X		X									
Het Eksternest													X							X		X									
Tante Truus													X							X											
ONZE		X				X			X		X					X						X	X	X	X					X	
Development Centre for Urban Farming Almere																										X		X			

5.2 A global city: London

London is the capital city of the UK and is located in the South East of England. It currently has a population of over 8 million and this is expected to grow to over 11 million by 2050 (GLA Intelligence, 2013). London's economic growth is currently outpacing the rest of the UK and is responsible for almost half of the UK's gross value added, while unemployment is higher than the national average (Office for National Statistics, 2015). London incomes are among the most unequal in England with 16% of the population in the poorest tenth nationally and 17% in the richest tenth. In fact, 2.1 million people in London were classified as in poverty in the three years up 2011/12 (Aldridge et al., 2013). At the time, this share of the population would equate to more than one in four Londoners, and above the national average for the UK.

According to data released by the emergency food aid charity, the Trussell Trust, there has been a 706% increase in the number of Londoners accessing its food banks between 2011 and 2014 (Trussell Trust, 2015). In the same period, the prevalence of obesity among children aged four to five years old (reception) and ten to eleven years old (Year 6) were the highest of anywhere in England – at 23% for Year 6 children. These highest rates of obesity are commonly found in those London boroughs with the highest indices of deprivation in the capital.

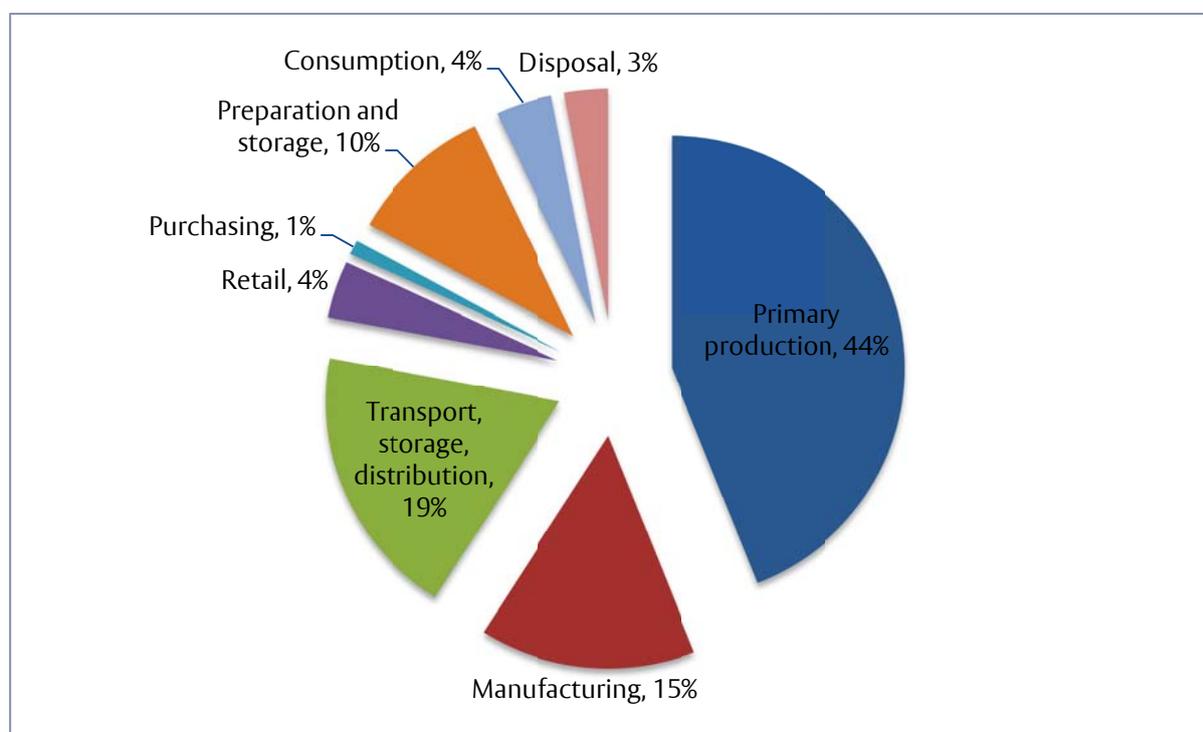
Figure 5.2 Percentage of children in Year 6 who are obese



(Source: NHS Information Centre)

In 2008, the Greater London Authority (GLA) published a report, 'London's food sector greenhouse gas emissions'. The report found that the cumulative emissions produced (from crop to mouth) by London's food consumption in one year amounted to almost 19 million tonnes, greater than that of the entire national output of Estonia in the same year (GLA, 2008). The report went on to highlight that this 'includes the full basket of greenhouse gases covered by the Kyoto Protocol', many of which are far more damaging to the environment than carbon dioxide (CO₂). The report also noted that the GLA's Climate Change Action Plan only incorporates CO₂ emissions, and only that CO₂ produced within the administrative boundary of London. As the report found that almost 80% of London's food-related emissions occur before the food has even entered the city, these are not captured by the Climate Change Action Plan either (Figure 5.3)

Figure 5.3 Total GHG emissions by stage of London's food system



(Source: GLA, 2008)

5.2.1 London Food Strategy

A key milestone in the development of London's alternative food landscape was the publication of London's inaugural Food Strategy. Former Mayor of London, Ken Livingstone, implemented the strategy in 2006. The primary motivation behind the scheme was to implement a strategy that could address the marked increase in diet-related health issues that had been recorded among Londoners. The strategy set out a ten-year plan of specified aims and targets to not only address these health issues directly, but also to tackle some of the wider socio-environmental factors that contribute to poor health (Box 5.1).

Box 5.1 Aims of the London Food Strategy

- to improve Londoners' health and reduce health inequalities
- to reduce the negative environmental impacts of London's food system
- to support a vibrant food economy
- to celebrate and promote London's food culture
- to develop London's food security

Responsibility for the strategic oversight and implementation of the strategy was granted to the newly created London Food Board, now chaired by former editor of the *Daily Express*, Rosie Boycott.

London has one of the most vibrant urban food-growing scenes in the world.
(Boycott, 2014)

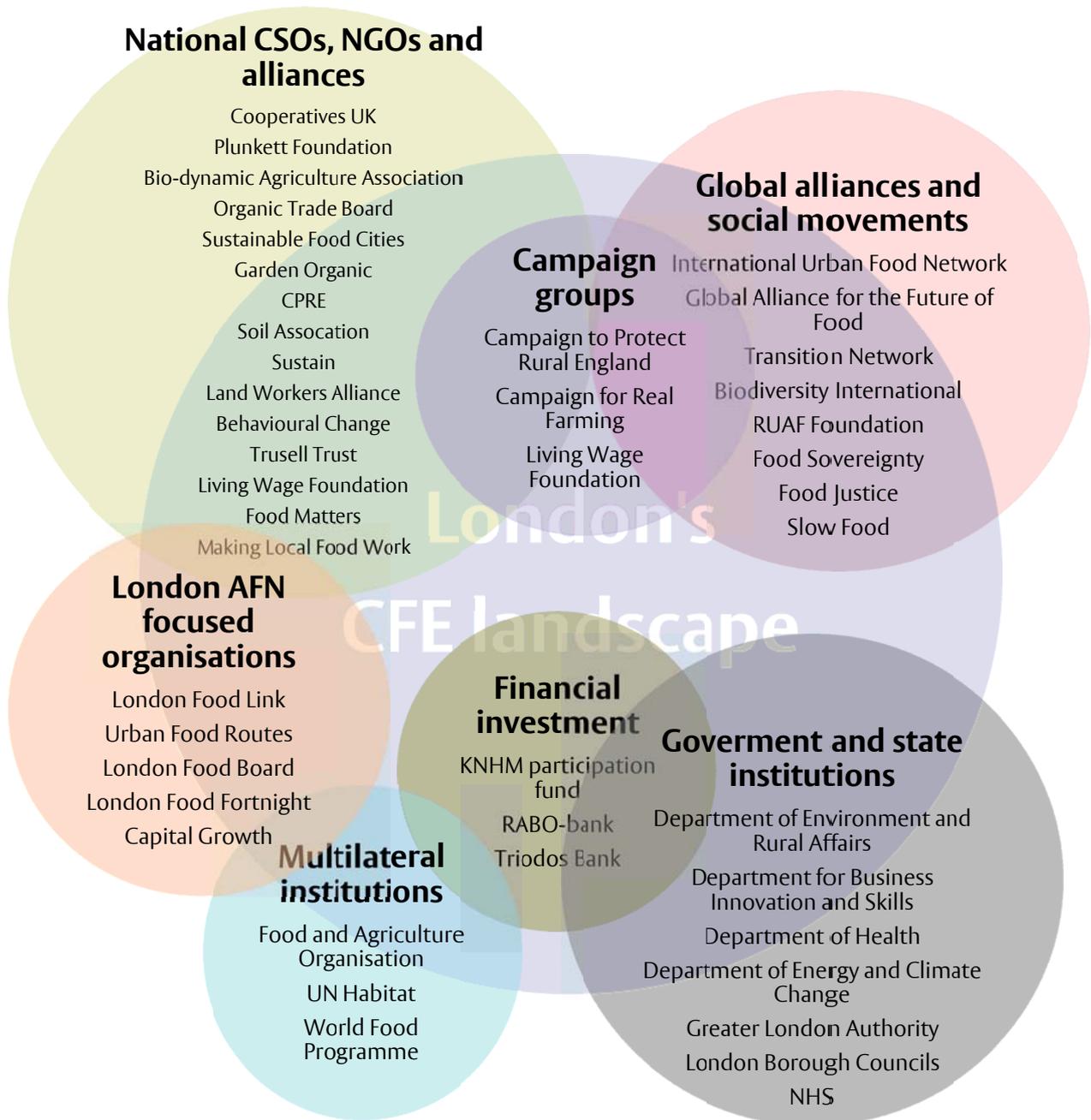
The London Food Board is an advisory panel made up of representatives from business, health, NGOs, CSOs, London's alternative food network and local government, and is charged with realising 'a vision for a world-class sustainable food system for London' (London Development Agency, 2006: 4). The strategy was first drafted in 2005, before undergoing a consultation process led by London Food Link, part of the charity Sustain. A sharp increase in alternative food activity has been witnessed in the capital in the years since the introduction of the strategy, propelled in no small part by funding from the Big Lottery's Local Food programme.

What marks this out is that it is a sustainable food strategy for a city, and not just any city, but the capital and largest city of the UK, and a world city too. It has found supporters and inspired officials in Europe, North America and as far afield as South Korea.

(Reynolds, 2009: 417)

While London does now possess a city-wide Food Strategy, there is no overarching organisational structure that can claim to umbrella the multitude of actors operating within London's urban food landscape. To assume a top-down organisational order to London's urban food landscape would be to misinterpret its evolution. A significant amount of bottom-up alternative food activity is taking place across the capital, shaping and influencing the role of food within the city (Figure 5.4). However, increasing levels of cooperation and collaboration between the GLA, the London Food Board and this multitude of actors, can be understood to have contributed to the sharp acceleration in alternative food activity witnessed across the capital since the year 2000.

Figure 5.4 Cursory illustration of the London's UFE landscape

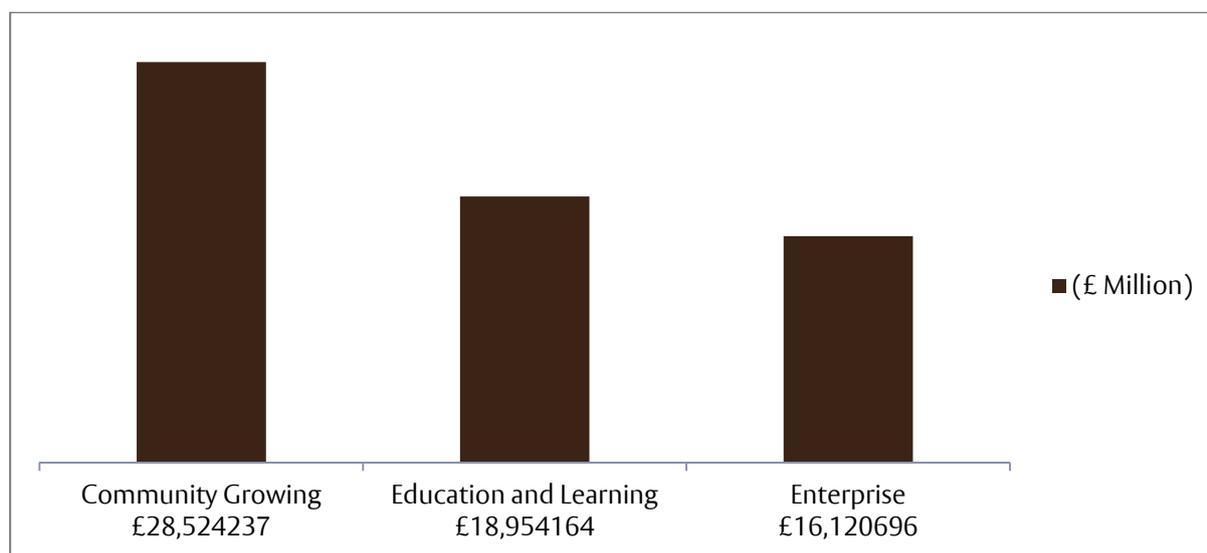


A further significant factor in this increase has been the implementation of local food strategies by five of London’s boroughs and the provision of space for the growing of food by 22 boroughs. These actions have helped to link local policy with the wider London Food Strategy and address some of the barriers facing those engaged in alternative food activity within these areas of the capital.

5.2.2 The Big Lottery Local Food programme

Between 2007 and 2014 the UK’s Big Lottery funded two programmes – Local Food and Making Local Food Work – with the aim of supporting local food activity across the UK. Both programmes were collaborative efforts between a number of NGOs and civil society organisations (CSOs), and sought to fund and provide support for a variety of food-related projects across the country. Local Food identified three key areas for its funding: (i) enterprise; (ii) community growing; and (iii) education and learning. Meanwhile the Making Local Food Work programme focused its efforts and available finances solely upon supporting the growth of the UK’s UFE sector. In total, over £16 million was allocated to supporting UFEs, almost £19 million to education and learning, and over £28 million to supporting community growing initiatives (Figure 5.5).

Figure 5.5 The distribution of the Big Lottery’s local food funding by Local Food and Making Local Food Work



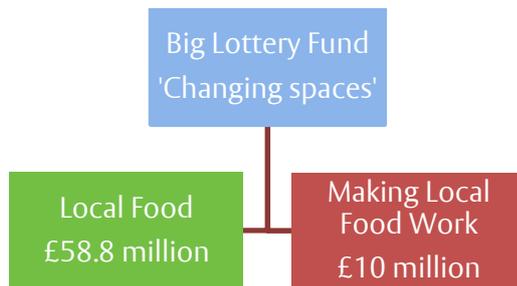
(Source: Authors)

The exact implications of allocating the largest amount of the Big Lottery’s local food funding to community growing initiatives is still unclear. Many policy makers are only beginning to engage with AFNs for the first time, and there is the potential that this bias in funding may lead to an interpretation among policy makers that local food is less about enterprise than it

is about community growing. Additionally, as many of these grant-funded projects now face closure because they have completed their funding cycles, it is possible that some will interpret this as failure: evidence that the urban alternative food agenda is misplaced.

After 2012, there will be a significant reduction in both grants and support programmes for urban food enterprises.
 (Making Local Food Work, 2012: 28)

Figure 5.6 Distribution of the Big Lottery’s local food funding between Local Food and Making Local Food Work



Two notable schemes located within London, which have each prospered from one or both of these allocations of funding (either directly or indirectly), are Capital Growth and Urban Food Routes (Figure 5.6). Both have undoubtedly had a significant impact in terms of shaping alternative food activity within the capital and represent significant case studies of collaborated efforts to administer alternative food delivery. See section 5.3 (on Reading), which looks at Food4families and True Food, schemes that have received significant funding from the Big Lottery Local Food programme.

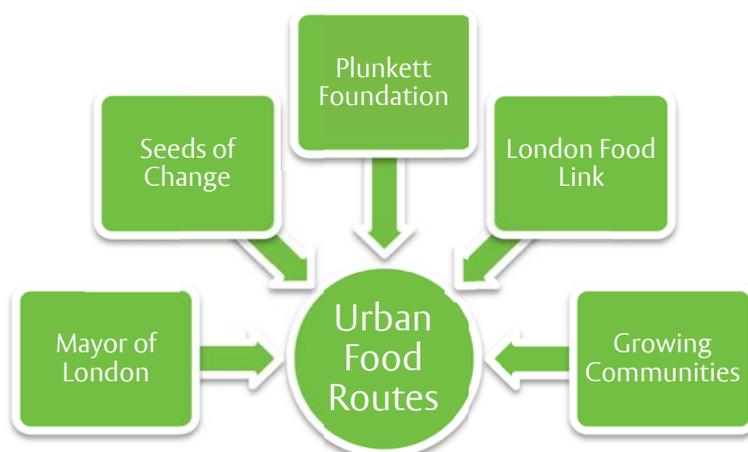
5.2.3 Capital Growth

Capital Growth was launched in November 2009 in a bid to increase the amount of land available for the growing of food within the City of London. This need had previously been identified in both the London Food Strategy (2006) and the London Plan (2008). The project was a collaborative initiative between the Mayor of London, the Big Lottery Local Food programme and the London Food Link charity, and was endorsed by the London Food Board. With London preparing to host the Olympics in the summer of 2012, it was decided that 2012 should signal both the end of the project and also the target number of growing spaces to be created.

By the end of the project over 99,000 people had taken part, almost 500,000 m² of growing space had been created, and two thirds of London's borough councils had agreed to support the Capital Growth project (Capital Growth, 2015). As well as surpassing its target of creating 2012 new growing spaces within the city, Capital Growth also made considerable strides in pushing forwards the commercialisation of urban growing within London, both through its publication *Roots to Work*, and by bringing together growers and retailers from around the capital to form their own food webs within the city. As well as numerous testimonials to the increased sense of community cohesion as a result of the project, many groups also continue to provide wider services such as educational support for young people not in employment, education or training (NEETs), employment opportunities and skills training for adults out of work, and access to the green-gym effect for those working the plots. In 2013, having achieved its stated goals, Capital Growth re-launched as London's Food Growing Network (LFGN) and now utilises its large network to support community-growing groups operating across the capital, encouraging them to collaborate, and to share information and resources.

5.2.4 Urban Food Routes

Urban Food Routes (Figure 5.7) is an initiative funded by the Mayor of London and Seeds of Change. The project is coordinated by the Plunkett Foundation and receives further specialist support from Growing Communities and London Food Link. It was launched off the back of the Food High Streets pilot project, which took place in London in 2013. Also an initiative of the Mayor of London, it sought to support four of the capital's most innovative food start-ups, offering financial investment and specialist support.

Figure 5.7 Network of actors involved in Urban Food Routes

The aim of Food High Streets was to demonstrate that London's businesses can incorporate community and co-operative values within their business models and still continue to achieve commercial viability. With three out of four of the enterprises that took part in the Food High Streets pilot project still active today, the model has been taken forward into 2015 under its new moniker Urban Food Routes.

Box 5.2 Food High Streets pilot project participant enterprises

- Unpackaged: non-packaging grocery shop
- Field to Fork Organics: co-operative vegetable bag scheme
- KERB: membership organisation of street food traders – hosts regular events and markets across London and populates with member traders
- Cultivate London: converts derelict sites in West London for agricultural purposes; provides work experience for NEETS before selling organically grown produce to local community.

(Source: www.urbanfoodroutes.org.uk)

Currently, 32 enterprises from across London receive Urban Food Routes' support programmes Plunkett Support and Plunkett Plus, courtesy of the NGO, the Plunkett Foundation. Additionally, those enterprises setting up new community-led box schemes can receive support from Growing Communities, a long-established UFE based in Hackney, East London. By collaborating in this manner, Urban Food Routes is able to act as an incubator, providing tailored specialist support and financial investment for enterprises from across the food value stream, under one umbrella organisation (Box 5.3). However unless these

organisations become commercially viable and economically embedded in their areas of practice, these grant-driven business models are vulnerable to economic shocks.

Box 5.3 Urban Food Routes enterprise criteria

Urban Food Routes supports enterprises that:

- employ 50 people or fewer
- operate in, and or are based in London
- operate in any part of the food sector – from growing and producing, to distribution, to retail or food service
- are either a new start-up or existing enterprise
- actively work with the local community and local residents to encourage participation and engagement
- are any type of business – for example social enterprises, community-owned enterprises or private enterprises
- are values-driven
- have a demonstrable need for both business advice and monetary support

(Urban Food Routes, 2015)

5.3 A regional town centre: Reading

Reading is a large town situated on the western tip of the London commuter belt and is directly comparable in terms of population size to one of London's outer boroughs. The town has long coveted city status and is a key economic centre of both the Thames Valley and the South East region of England. Despite its commercial significance, Reading still possesses

a growing gap in wealth between neighbourhoods. Low unemployment levels mask the high costs of living and low wages for many. 6,470 (18.8%) children are in poverty and 9.8% of households are in fuel poverty. The starkest statistic is that life expectancy in the most deprived areas of Reading is 9.2 years lower for men and 6.3 years lower for women compared to the least deprived areas.

(Reading Borough Council, 2015)

Like London, Reading has an above-national average obesity rate among children aged four to five years old (reception) and ten to eleven years old (Year 6).

Reading has a single unitary authority, Reading Borough Council (RBC), which boasts both a climate change and waste management strategy, but as yet has no clearly defined strategy for food. The Reading Climate Change Partnership (a subgroup of the Reading Local Strategic Partnership) assists in the delivery of Reading's Climate Change Strategy as well as its Sustainable Community Strategy. It also participates in Climate Berkshire, a countywide group of local authorities and partner organisations from across Berkshire aimed at strategically addressing challenges and opportunities linked to climate change.

Reading can only lay claim to a small area of green space due to its close proximity to the M4 motorway, which forms its boundary to the south, and the Oxfordshire county border and River Thames to its north. Because of this, space for growing within the borough is significantly restricted and allocated growing spaces, such as allotments, are oversubscribed.

Reading has a small number of UFEs, including growers, retailers and food co-operatives. There are also a number of small organic farms located in rural areas just outside of the town. Two notable organisations operating within Reading are the Reading International Solidarity Centre and the True Food Community Co-operative (Figure 5.8).

Figure 5.8 Cursory illustration of Reading’s UFE landscape



5.3.1 Reading International Solidarity Centre

Reading International Solidarity Centre (RISC) is a development education centre that works with schools and community groups to raise the profile of global issues and promote action for sustainability, human rights and social justice (RISC, 2015).

The centre has its own roof garden and café, and facilitates a number of food-related networks operating within the Reading area. The two foremost examples of these networks are Food4Families and the Reading Food Growing Network, both organised by RISC. Like both Urban Food Routes and Capital Growth, the Big Lottery funds Food4Families. This project aims to create a network of food-growing gardens across Reading where parents and children will learn how to grow their own food together, enabling young people and their families to learn new growing skills, introduce fresh produce into their diets and learn about sustainable living. It also aims to support schools to integrate the outdoor classroom into their curriculum through practical activities (RISC, 2015).

The Reading Food Growing Network was recently established to promote sustainable local food production in Reading. The network encourages and enables the sharing of resources, information and purchasing capacity between food growers in Reading, particularly seed and manure purchase and plant swaps. It also provides advice and support to existing and new growers, as well as promoting town-wide food-related activities such as the Reading Town Meal (www.readingtowntmeal.org.uk) and Harvest Reading (www.readingfoodgrowingnetwork.org.uk).

5.3.2 True Food Community Co-operative

'At its most basic level True Food Co-op (TFCC) is a large-scale buying group' (True Food Community Co-operative, 2015). It was formally established in December 2004, following five years of operating as an informal community food club. Funding to the project over the years has included the European Social Fund and the Big Lottery Local Food programme. The co-operative exists primarily on the profit from trading, supplemented by membership investment and donations. TFCC operates as a shop on the northern edge of Reading. The shop is open five days a week and is run by paid staff, members and volunteers. The co-operative used to run a number of markets in different parts of town on different nights allowing easier access to local organic produce to local residents. In 2010 they opened the shop in Emmer Green and continued running three or four markets a week for the next few years. In early 2014 the group decided to discontinue the markets to ensure the co-op's financial viability. The co-operative continues to operate out of its shop, but its struggle to maintain its expansion is an example of many of the challenges facing UFEs, particularly in terms of social and financial resources.

5.4 A polycentric 'garden city': Almere

5.4.1 Almere (Netherlands)

Almere is situated on the Zuidelijk Flevoland polder, northeast of Amsterdam. This polder was primarily developed to create agricultural land, and space for urban development and natural habitat. Situated near Amsterdam in the 'north wing' of the urbanised Randstad, Almere was needed to fulfil the demand for new dwellings. It is a polycentric 'garden city', with each of its urban centres surrounded by agricultural land, grassland and forests (green), and water (blue). These 'green' and 'blue' areas constitute 25% of the total land area, which will be subject to future development.

5.4.2 Urban farming in Almere

Traditionally, agriculture was an important economic pillar of the Flevoland province. The first form of urban agriculture in this fast-growing city took place on land that was designated for urban expansion. In around 1996, urban farming initiatives were taken up by members of the Urban Farm project (in Dutch: Stadsboerderij). In the years that followed, a strong focus on urban agriculture developed in the city of Almere. This has been mainly due to initiatives by citizens, with support from policies at national, provincial and municipal levels and other forms of institutional support. Today a growing number of small non-commercial and a few medium scaled, commercially viable initiatives have been realised, in addition to 13 allotment gardens that have experienced an increased demand in recent years after a long period of decline.

5.4.3 Political–institutional environment for urban farming in Almere

The conditions for urban farming in Almere are becoming more favourable due to the development and environmental conservation agendas of the province, and related programmes and projects. Strategic policies and guidance provide conditions for rural and suburban living environments mixed with commercial farming, such as the Oosterwold programme. Other policy programmes such as Colour to the Green and the Floriade World Horticulture Expo in 2022 will aim to encourage urban farming activity at a micro scale, which has experienced a significant increase in activity in recent years. Altogether, several policy approaches have been developed and tested in Almere.

The National and Regional Almere–Amsterdam–Markermeer (RRAAM) features prominently among these policy initiatives. The international competitive strength of the Randstad (the cities of western Holland) is under pressure. The Randstad needs space to expand, and Almere has this space. In turn, Almere and the national government have agreed upon the building of 60,000 new houses and the creation of 100,000 new jobs in the coming decades. This has been agreed upon and worked out in the policy document RRAAM.

For Almere, the suburban polycentric concept of the ‘garden city’ remains a principal point of reference for these planned developments. Some of this demand for housing and jobs will be centred in Oosterwold alongside the designated Floriade 2022 World Horticultural Expo site (Figure 5.9, Figure 5.10). 300 ha have been set aside for 15,000 houses, with an average of five houses per ha, and 20,000 jobs in this area, which will be composed of a mixture of farms and urban dwellings. This combination of urban farming and housing has been met with the enthusiasm of citizens, entrepreneurs and NGOs across 79 proposed projects. Due to several proposals for the same location, the province has invited 22 proposals at 14 locations to further develop their plans.

Figure 5.9 Aerial photograph of Almere with planned area of Oosterwold



(Source: City of Almere)

Figure 5.10 Oosterwold: rural and suburban living environment

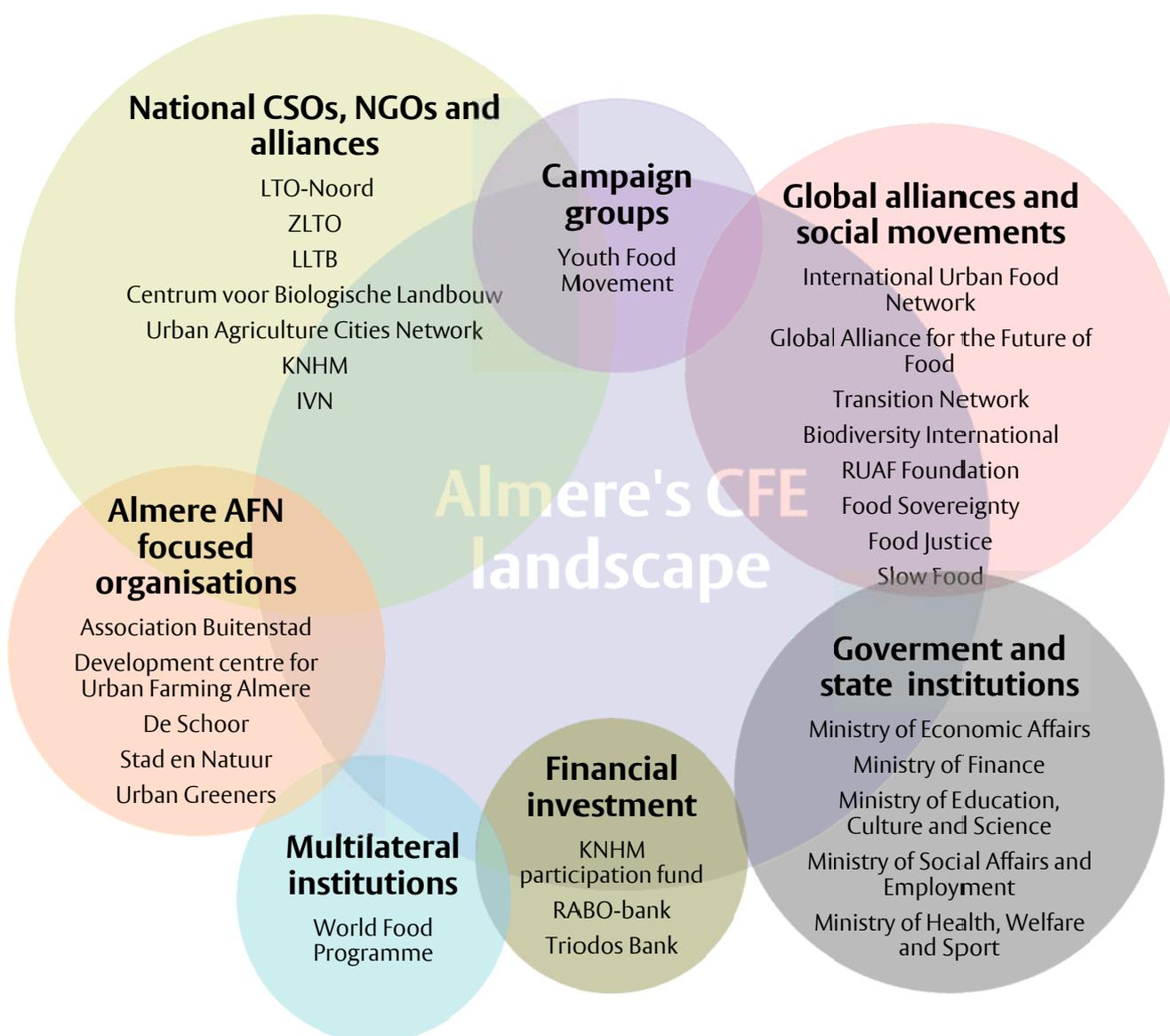


(Source: City of Almere)

This form of agricultural urbanism will be reinforced through the Floriade World Horticulture Exhibition in 2022 (<http://floriade.almere.nl/>). Urban farming is not meant to be the goal in and of itself; rather it is a means to address different urban problems (by, for example, reinforcing waste to energy streams) while also contributing to feeding and greening the city, and stimulating economic development and well-being among citizens. The Colour to the Green development framework, meanwhile, will aim to integrate sustainable economic activities within green areas of the city.

Behind these strategic development frameworks lies a web of institutional support networks (Figure 5.11). The Urban Agriculture Cities Network, in which 20 other municipalities participate, is a part of this institutional landscape. This network collaborates with other organisations in bringing urban agriculture into practice, including the development of institutional links between existing local initiatives and regional food chains.

Figure 5.11 Cursory illustration of Almere’s UFE landscape



The Almere-based support includes the Development Centre of Urban Agriculture Almere (Ontwikkelcentrum Stadslandbouw Almere, OSA; www.os-almere.nl), which was founded in 2011 with the aim of contributing to the development of a city where urban agriculture is a

natural part of the urban environment. OSA achieves this by working on projects with entrepreneurs, institutions and citizens to start new initiatives and business cases of urban agriculture. At the same time, it brings coherence to existing and new initiatives around urban agriculture and support in making coherent policy. OSA is a partnership of Wageningen University, CAH-Vilentum (University of Applied Sciences), Witteveen+Bos engineers, and the Economic Development Board Flevoland. The Association Buitenstad (www.buitenstad.nl), which was founded earlier in 2010, offers a complementary support platform. The aim of the network is to strengthen the quality and identity of the urban landscape of Almere. Association Buitenstad wants to form a learning, initiating and enterprising network of existing initiatives: a network that supports and develops new initiatives together with their members.

6 Surveys: urban food enterprises and consumers

6.1 Overview

6.1.1 Survey design

The two online surveys, one for UFEs and one for consumers (A8.1–2), as stated in the introduction, were designed to be complementary, to gain insight into the engagement between producers (suppliers) and consumers, and how this is evidenced in business models, their motivations and the barriers perceived by both parties. The surveys included both quantitative and qualitative methods and utilised structured and unstructured questions, allowing participants to add weight to certain statements, to agree with or reject others, and to offer comments of their own as well. The surveys were carried out across all three case study cities and were available in English and Dutch.

The UFE survey sought details on the activities of the UFE encompassing primary production, food processing, food retailing and catering, with filters to allow individual UFEs to answer questions most appropriate to their activities. The survey was framed in such a manner that it clear that enterprises were not understood merely as stand-alone entities. The survey also sought to investigate multiple factors that might contribute to the potential success or failure of local food operators and systems. This included inviting insights from UFEs on: policy opportunities and barriers for UFEs and alternative food markets on local, national and transnational scales; the governance of food systems; the potential of UFEs to extend influence over the behaviours and purchasing habits of their consumers; the relationships and quality of linkages between UFEs; and on their capacity to operate in a cooperative and mutually beneficial manner. In all cases, the UFEs were asked questions on motivations, the barriers they faced, the products they dealt with, the links between the activities, including details of distribution (transport) and waste management, their revenue streams, and staffing. The perceptions of the contribution of greenhouse gas emissions from the different food producing sectors were also sought. The UFE survey was fully completed by four UFEs operating within the survey's catchment area of London, four in the catchment area of Reading, and six in the catchment area of Almere. It is recognised that it is difficult to draw concrete conclusions from this number; nevertheless the insights provided are valuable.

The consumer survey investigated the perceptions of consumers who shop with UFEs regarding local food. As well as gathering basic demographic data on consumers of local food, the survey sought to probe participants for the motives behind their decision to 'buy

local', and sought to understand any perceived barriers to this. The survey sought to understand the wider purchasing habits of UFE consumers: where they conduct their shopping, what they buy and how much they spend. Their perceptions of the concept of local food and the contribution of greenhouse gas emissions from the different food producing sectors were also sought. 54 consumers within the survey's catchment areas of London and Reading, and 46 consumers in the catchment area of Almere, completed the consumer survey.

6.1.2 Survey delivery

The UFE and consumer surveys were delivered through an online survey platform, Qualtrics, provided through the Cities on the Grow website, and were for completion by UFEs and consumers who operated or resided within a 30 mile (50km) radius of the edge of one of the case study cities (London, Reading or Almere). For the UFEs, the requirements were: that they were businesses run as social enterprises for the benefit of their local community; that they take an active role, for at least part of their operations, in one or more stages of the food system (Figure 1.1); and that they have as their primary objective the provision of products and services in a manner that is socially and ecologically sustainable. For the consumers, the survey was only for completion by those persons responsible for conducting the food shopping within their household.

In both the UK and Almere, contacts for UFEs were provided through the snowball method starting with known UFEs in Almere and Reading. In London, Sustain provided their known UFE contact details. In all cases, the UFEs were contacted and asked to participate. This was achieved through email notification and, in some cases, a telephone call to direct the potential respondent to the website.

To generate responses to the consumer survey, dissemination at farmers' markets (one in Almere, two in Reading) was undertaken. Respondents had the opportunity to complete either a hard or online copy at that point in time or be given details to complete online after the event and in their own time. Over 50% of the surveys completed were collected as a result of the researchers attending these farmers' markets.

6.2 Scale of operations and financial structure

6.2.1 Enterprise classification

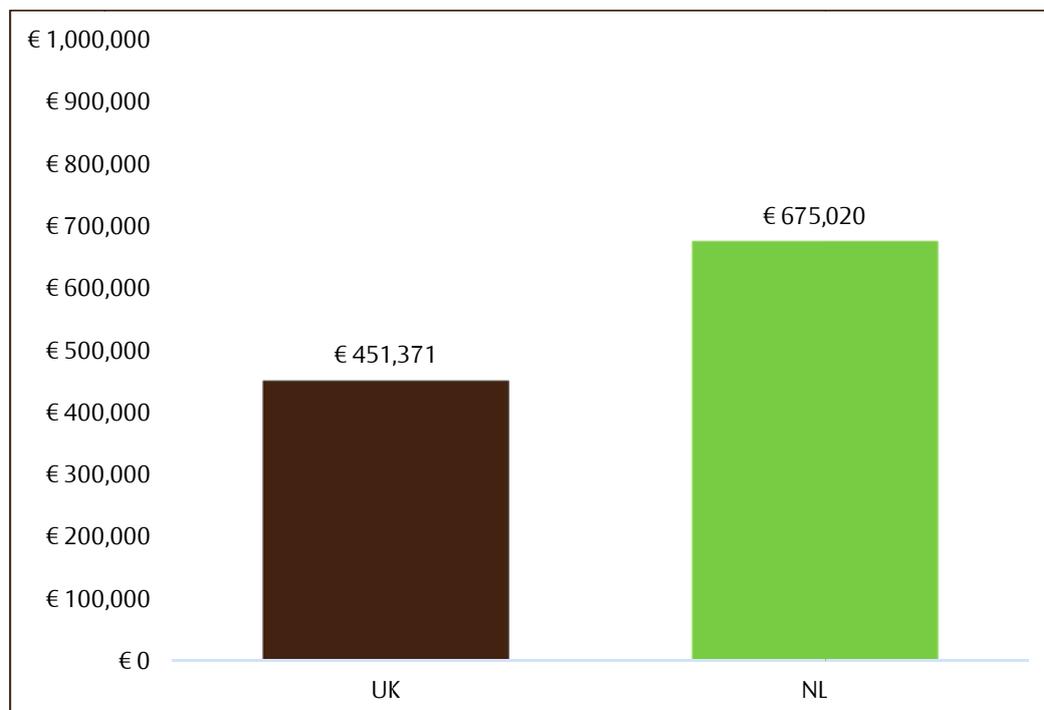
Table 6.1 illustrates the European Commission’s (EC) definition of small and medium-sized enterprises (SMEs). With the average turnover of UK UFEs surveyed standing at €451,371 and their Dutch counterparts at €675,020 (see Figure 6.1), the average UFE in each instance possesses a turnover akin to that of a micro enterprise.

Table 6.1 Medium-sized, small and micro enterprise

Company category	Employees	Turnover
Medium-sized	<250	≤€50 million
Small	<50	≤€10 million
Micro	<10	≤€2 million

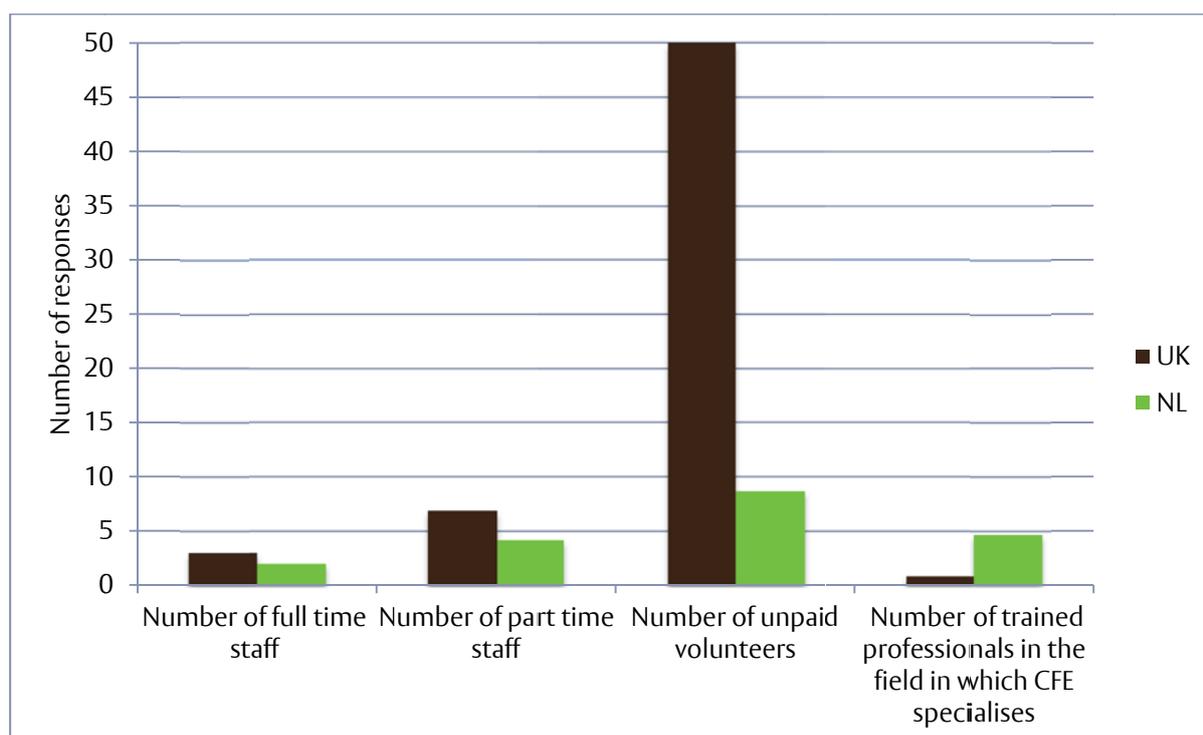
(Source: European Commission, n.d.)

Figure 6.1 Average annual turnover of UFEs



Indeed, not one of the UFEs surveyed in any of the case study cities broke the €2 million (turnover) ceiling required to meet the EC's definition of a small enterprise. UK UFEs averaged 9.88 members of staff (see Figure 6.2), close to that of a small enterprise. But with over two thirds of these employed on a part-time basis, this factor should also be considered well within the EC's definition of a micro enterprise.

Figure 6.2 Average number of people employed by UFEs



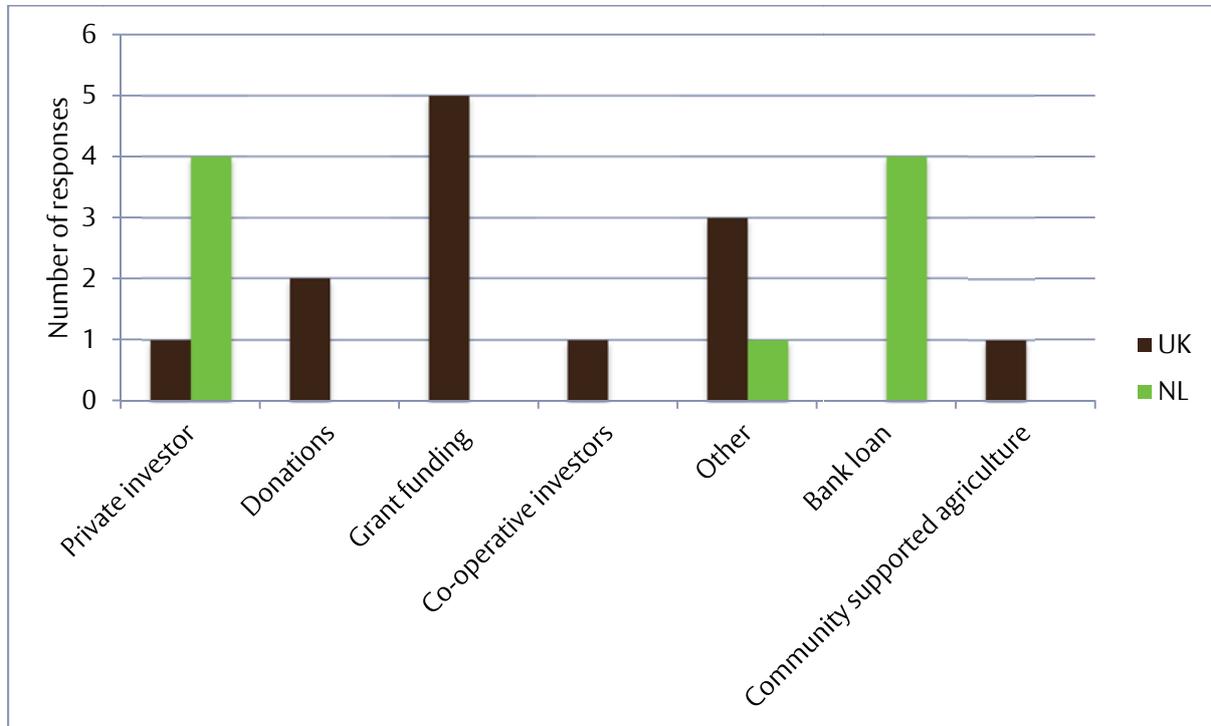
Responses to the question on their legal structure generated a variety of responses from London/Reading covering voluntary/community initiative, charity, cooperative, sole trader, private limited company, and food buying group, with cooperative being the most dominant form (3 of the 8 responses). In Almere, the majority were buying groups (5 out of 6 responses), with one exception that defined itself as a public limited company.

6.2.2 UFE investment and revenue streams

Figure 6.3 illustrates the sources of financial investment of UFEs upon start-up. As highlighted earlier in this report, it is common for UFEs to have multiple sources of investment upon start-up, particularly when they are reliant upon different forms of donation, be it private philanthropy or grant funding. Figure 6.3 also shows a clear disparity between the Dutch UFEs, whose financial investment upon start-up is primarily based upon bank loans and private investment, and their UK counterparts who, in all but one instance, rely solely upon forms of donation and community funding. This arguably reflects the prevalence

of funding available to UFEs in the UK, particularly the Big Lottery’s Local Food and Making Local Food Work funding streams.

Figure 6.3 Sources of financial investment upon start-up



Figures 6.4 and 6.5 go on to illustrate the manner in which UFEs often have multiple ongoing revenue streams, with over 50% of those surveyed saying they had chosen to diversify their revenue streams as a means of ensuring their commercial viability (Figure 6.4).

Figure 6.4 Percentage of UFEs that say they have chosen to diversify their revenue streams

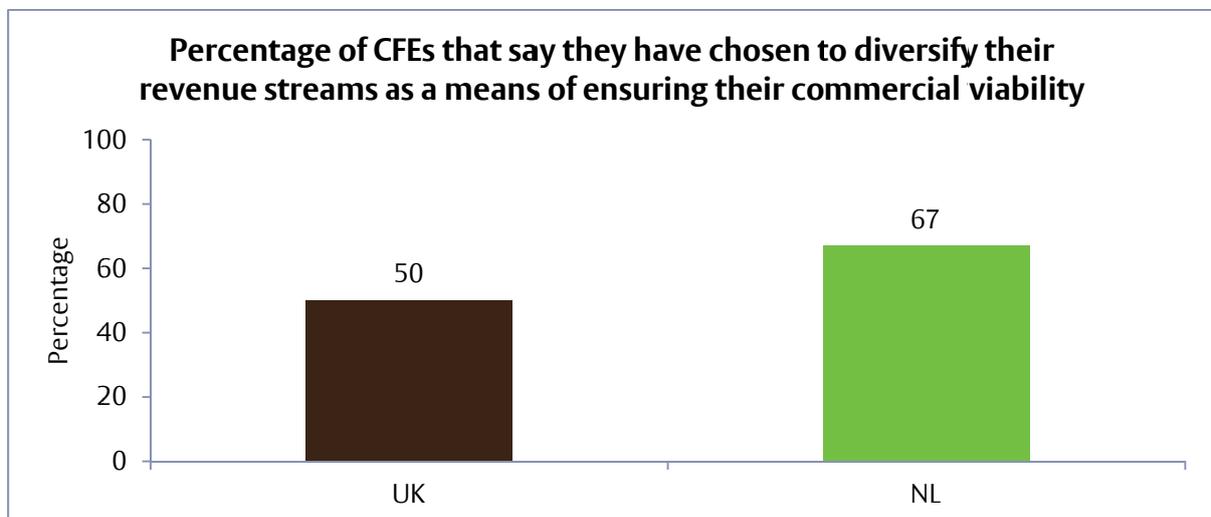
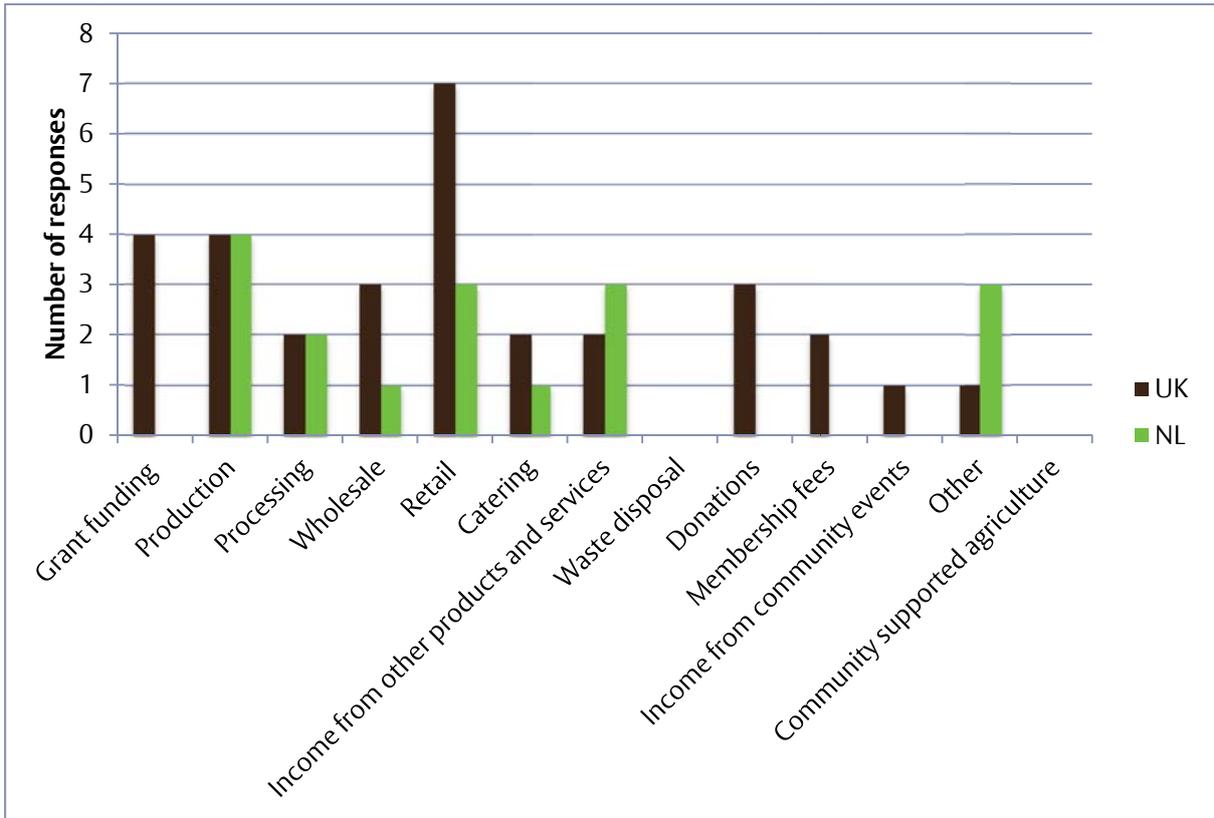


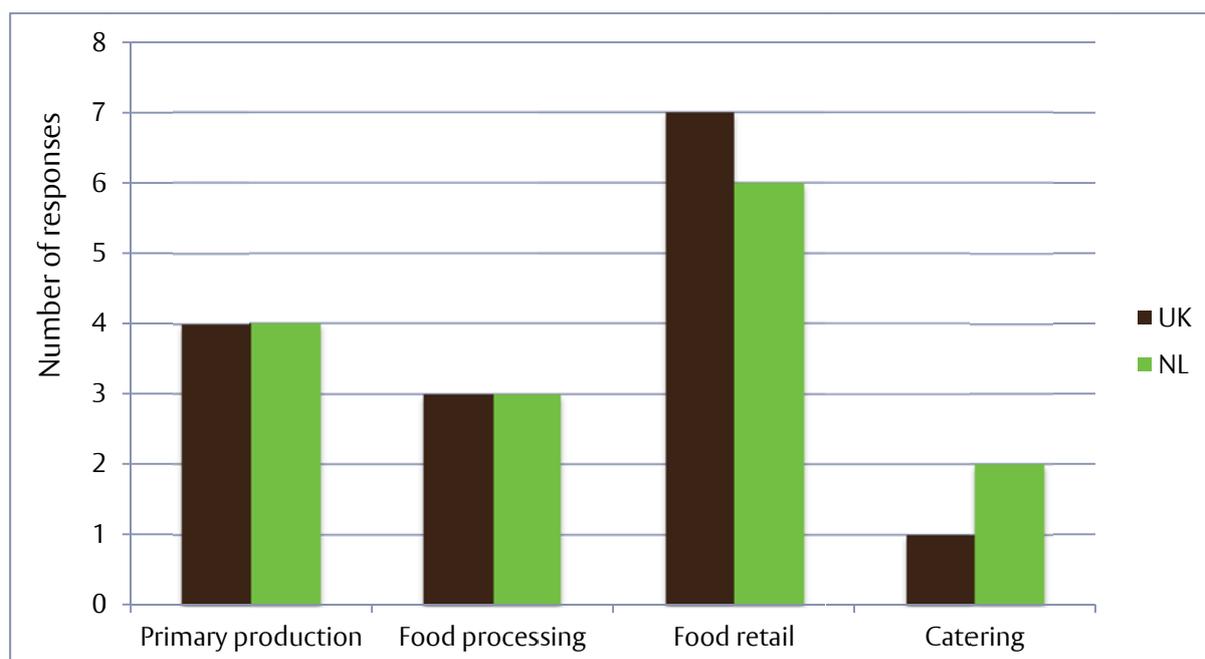
Figure 6.5 Current revenue streams of UFEs



6.3 Flows of food and food systems

Figure 6.6 captures the breakdown of the UFEs surveyed in terms of the activities they are engaged in, making a distinction between those operating in London/Reading (UK) and those in Almere (NL).

Figure 6.6 Activities undertaken by UFEs



6.3.1 Primary production

Figure 6.7 illustrates the products produced by those UFEs engaged in primary production practices. It is notable that all the producers surveyed in London/Reading (UK) engage in the production of high value perishables (in particular, salads), while across all the case study cities in both countries only one UFE is involved in any form of meat production and none in dairy.

All of the producers surveyed said they grow their produce in soil, with one UK UFE also growing on a hard standing. On average, the Dutch producers operate across 6.75 different plots, while their UK counterparts operate from an average of four. Leases on the land for all producers ranged greatly from 1 to 30 years, with notice to vacate the land averaging around six months. 75% of UK producers said they have made changes to the use of the land they operate on, compared with 50% of their Dutch counterparts. Complications to securing such changes included: some confusion as to whether planning consent was required to make the necessary changes; assessing whether the tenancies are secure enough to justify investment of time and finance in the plots; contaminated soil testing; complexities involved in gaining organic certification; and gaining access to land at the outset. When asked what systems they have in place to manage waste created during production processes, all producers said they compost their own organic waste and recycle other waste packaging involved in their processes.

Figure 6.7 Products produced by UFEs engaged in primary production

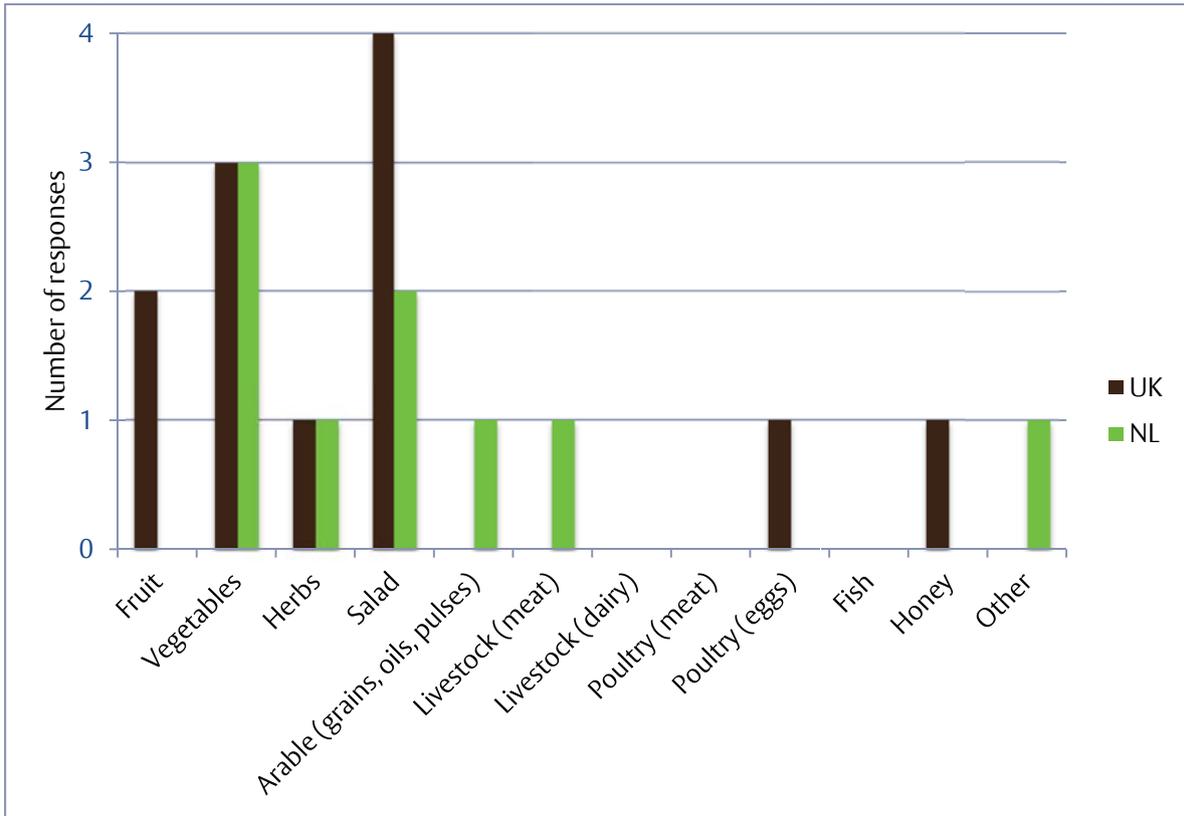
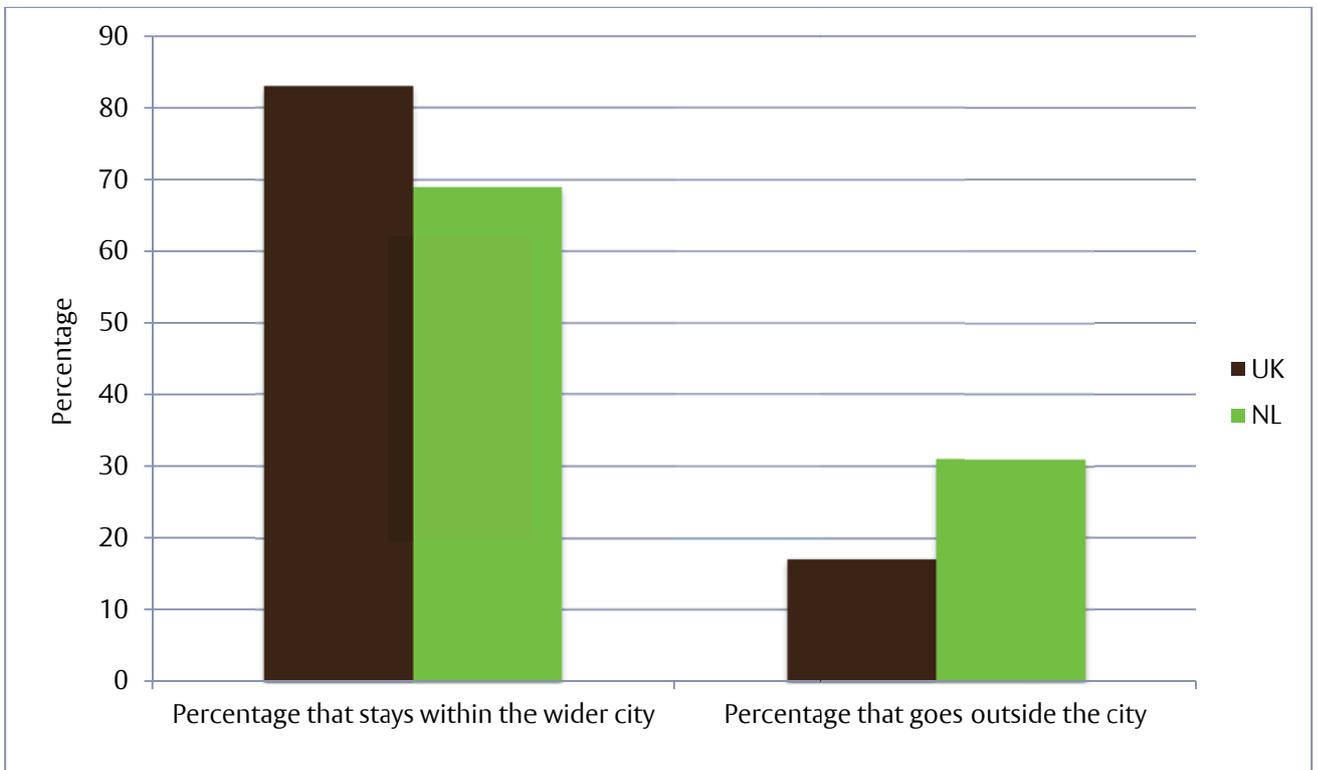


Figure 6.8 Share of primary production that stays in the wider city



UK-based producers estimate that over 80% of their produce stays within the city in which they are located, compared with around 70% for their Dutch counterparts (Figure 6.8). This may be related to the types of produce and whether it is suitable for direct consumption or is intended to be taken for processing to be turned into secondary products. As food processing plants are often based outside major cities, produce intended for processing will often need to be transported greater distances.

6.3.2 Food processing

Figure 6.9 illustrates the products that those UFEs engaged in the processing of food specialise in growing. Some synergies are notable between Figure 6.7 (products produced by UFEs engaged in primary production) and Figure 6.9. For example the absence of meat production by UK-based UFEs (Figure 6.7) is reflected in Figure 6.9, with no UK-based processors engaging in meat processing.

Figure 6.9 Product specialisation of processors

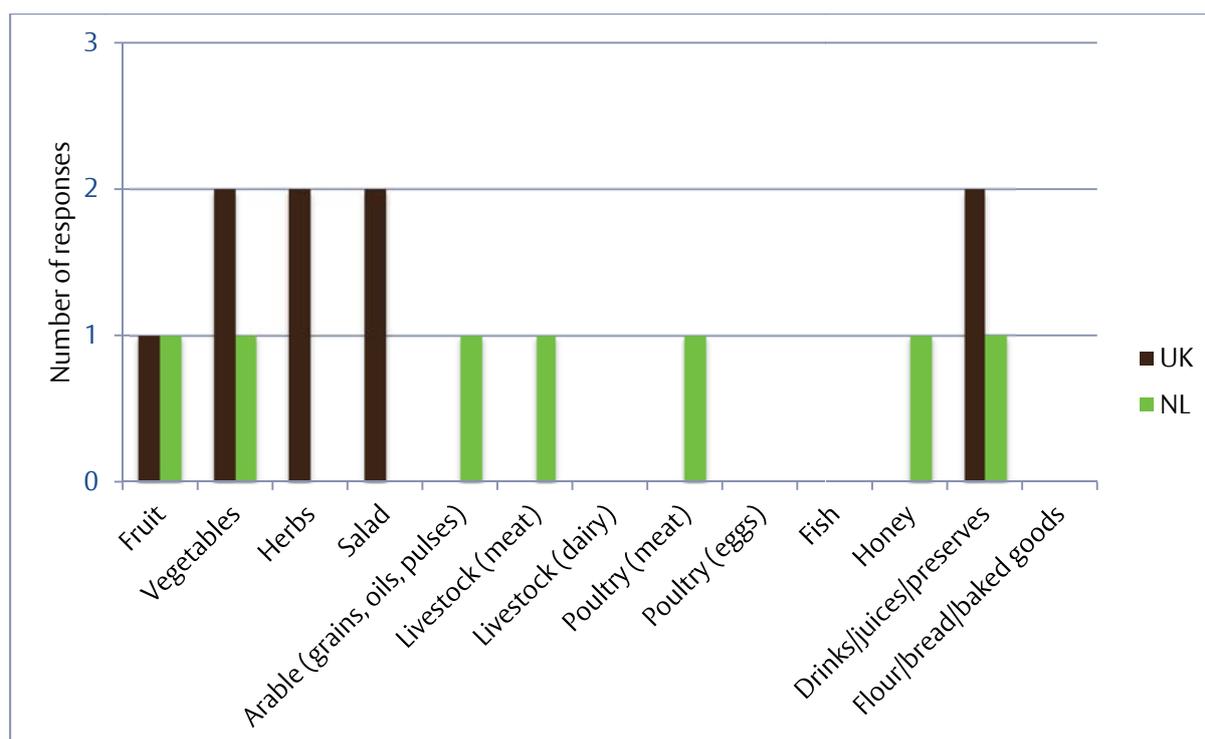


Figure 6.10 represents an estimate, made by UFEs engaged in processing, of the percentage of their produce that is: sourced within the city in which they are located, their own produce, and that which is sourced from outside the city.

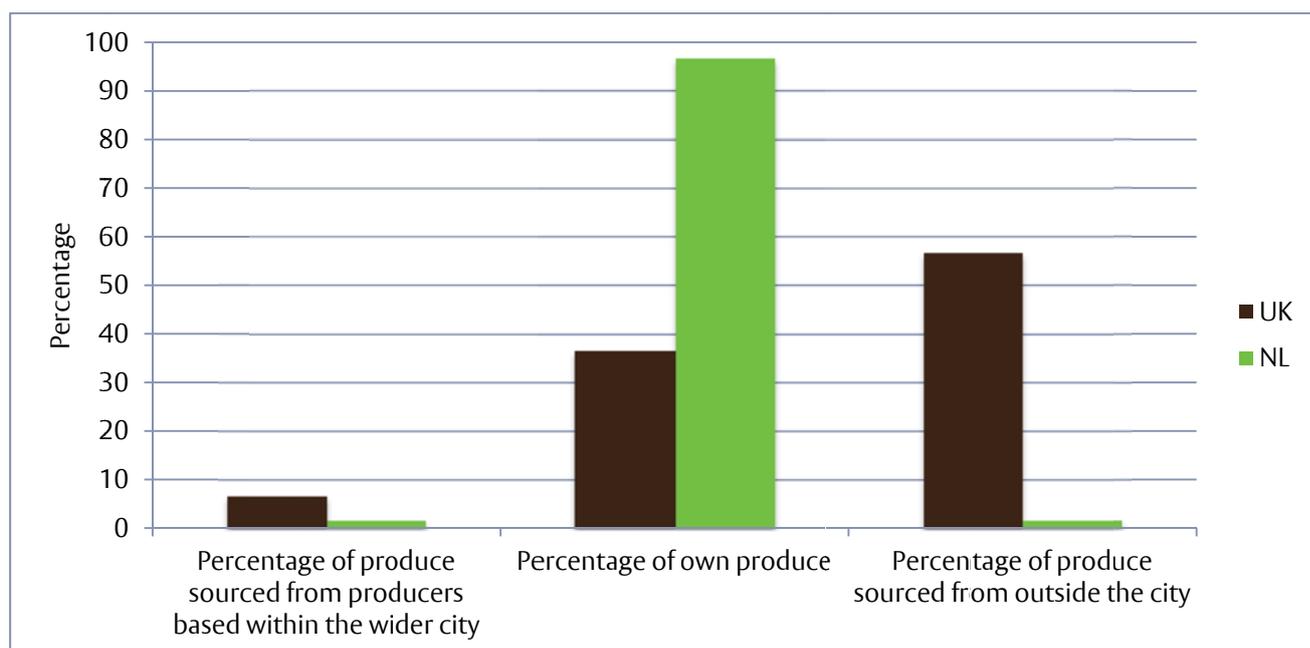
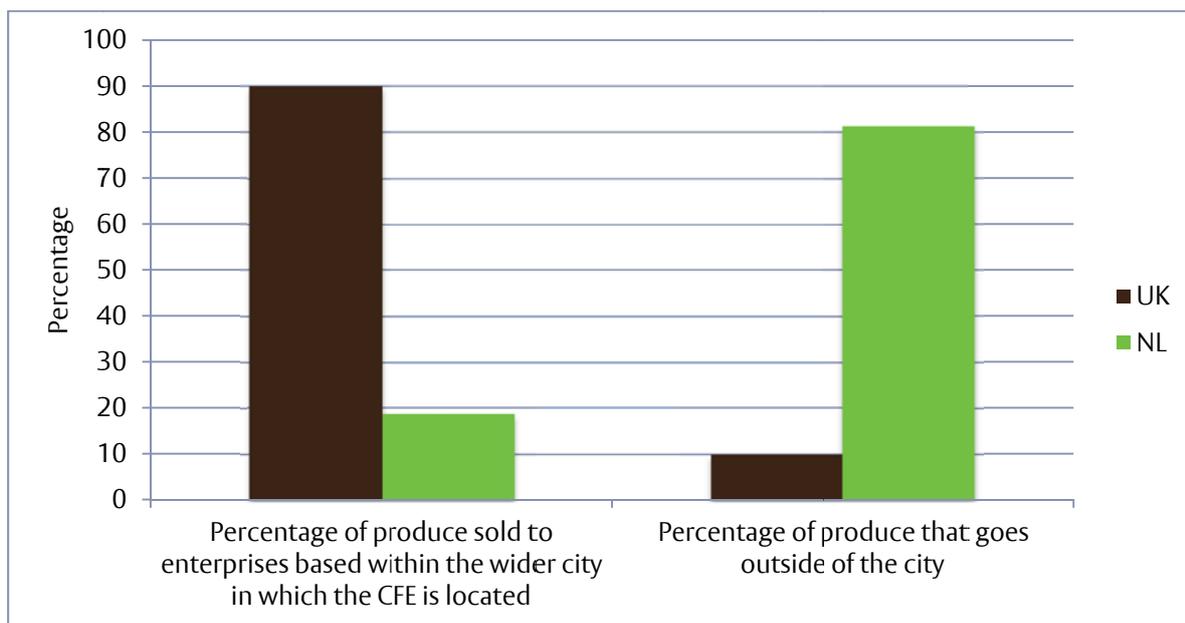
Figure 6.10 Source of processed goods

Figure 6.10 suggests that Dutch UFEs engaged in the processing of food, produce the majority of the raw produce they require themselves and source very little raw produce from other producers. In the case of UK UFEs, they too produce their own produce but also may supplement this with produce sourced from producers based outside the city. This may suggest that while many UFEs engage in both the primary production and processing of their own produce, there is little evidence of significant levels of trade and interaction between different UFEs operating within the same cities at different stages of the food value stream.

6.3.3 Food retail/catering

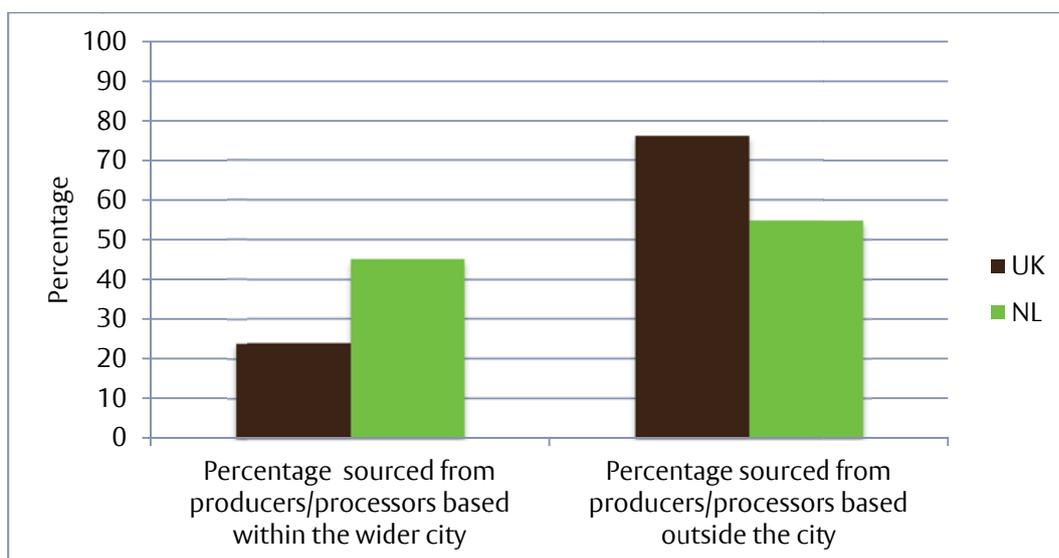
Urban food enterprises engaged in processing were also asked to estimate what percentage of their produce post-processing is sold within or outside of the city in which their operations are located. Figure 6.11 shows a considerable disparity between the UK, where the vast majority of produce processed within the city remains within the city, and the Netherlands, where the majority of produce processed within the city is destined for markets outside of the city.

Figure 6.11 Share of processed goods that stays in the wider city



Even though UK UFEs that are engaged in food processing estimate that 90% of their produce post-processing stays within the city in they are located, Figure 6.12 suggests that both UK and NL based UFEs engaged in retail are sourcing a substantial amount of their produce – 76% and 55% respectively – from outside of the city. This could again suggest that there are no significant levels of trade and interaction between UFEs. An alternative suggestion is that demand for the type of food being retailed outstrips city supply and thus has to be sourced elsewhere. This could be in terms of quantity or, perhaps more likely, the requirements for a wider range of food products. Whereas producers may be driven by local, and seasonal and organic produce, retail and catering retail and catering may be seeking to

Figure 6.12 Where retail UFEs source their products



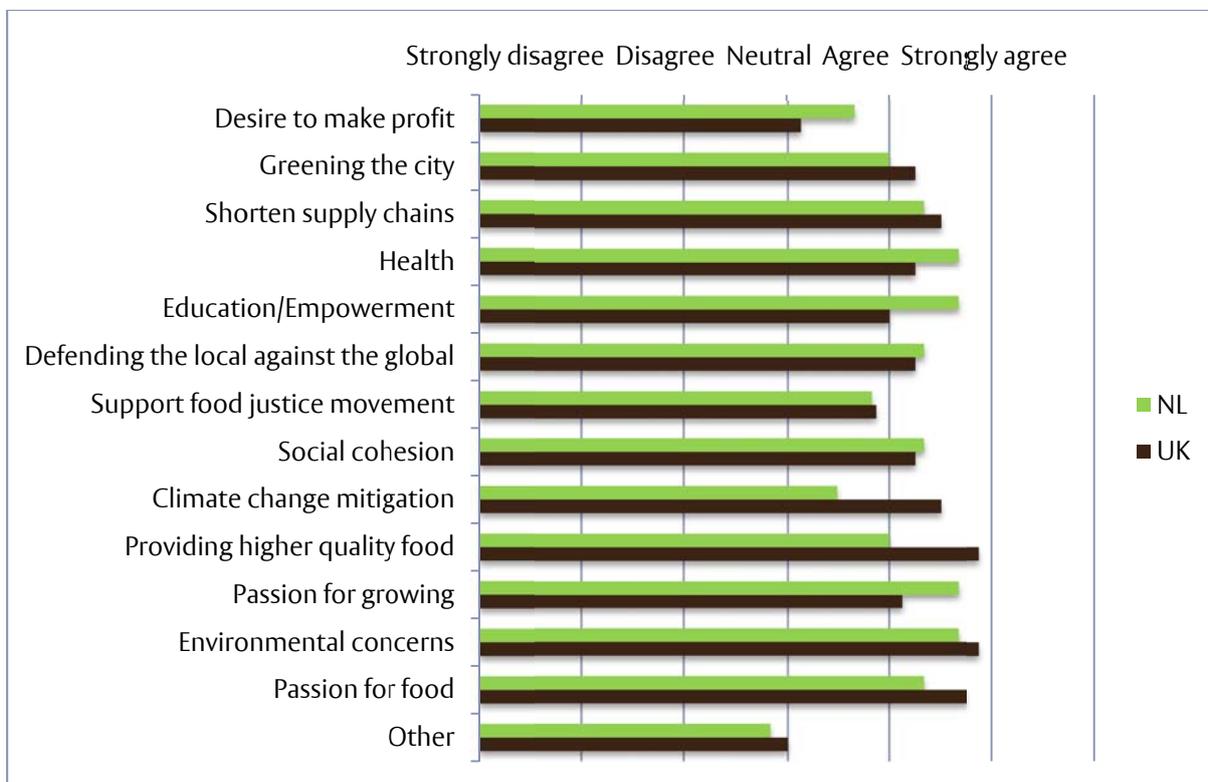
supply organic and fair trade, possibly low meat and wholefood consumer demands. In contrast, the small number of UFEs engaged in food catering supports the former hypotheses, with all respondents stating that they grow all of their own produce and do not source any from outside of the city in which they are located.

6.4 Community food enterprise and consumer motivations

6.4.1 Motivations of UFEs

During the survey UFE participants were presented with a number of statements of motivation and using a Likert scale were asked to attach a value to these statements. Figure 6.13 shows the average ranking of these statements across all the responses.

Figure 6.13 Motivation of UFEs



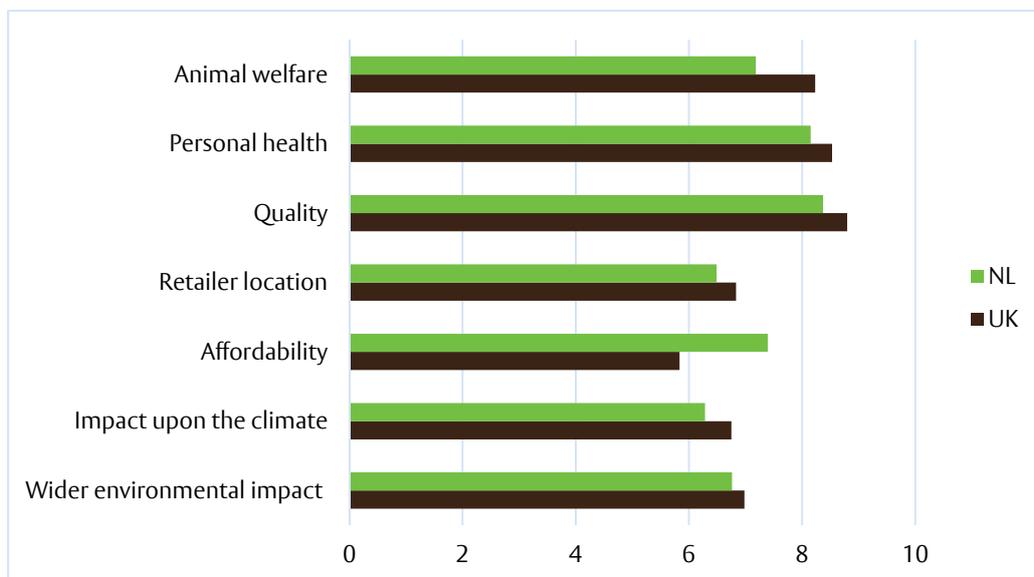
While Figure 6.13 illustrates considerable clustering around moderate agreement with many of the statements, it is interesting to note that, in the case of UK UFEs, the 'desire to make profit' factors comparatively low compared with other competing statements. This might well be explained by the prevalence of grant funding available to UK UFEs, which relieves some of the pressure upon them to ensure profitability in their business model. Conversely, the 'desire to make a profit' factors higher in the Dutch case. There are also differences in responses between the UK and NL with regard to 'climate change mitigation' and to a lesser extent 'providing higher quality food', 'education/empowerment' and 'passion for growing'.

100% of UK UFEs and 83% of Dutch UFEs say they consider themselves to be part of a wider local food ‘movement’ and seek to network with other enterprises they deem ‘like-minded’.

6.4.2 Motivations of UFE consumers

In the consumer survey, respondents were asked what considerations were most important to them when purchasing food (Figure 6.14). The results of the survey suggest consumers that shop with UFEs typically take a personal stance towards purchasing local food. This can be seen in the manner in which quality, personal health, animal welfare, and in Almere (NL), affordability consistently score highly, while wider, more cosmopolitan concerns for climate and environmental impacts score lower.

Figure 6.14 What considerations are most important to consumers when purchasing food (0 = unimportant, 10 = important)



A second question explored the motivations of consumers for buying local food specifically. Figure 6.15 illustrates the different responses evident between the UK (London/Reading) and the Netherlands (Almere). In the UK, ‘to support my local economy’, ‘knowledge of where the food comes from’, ‘reduced food miles’, ‘because it is more sustainable’, ‘better quality of food’, and ‘reduced climate impact’ score highly, between 59% and 89%. ‘Reduced food miles’, ‘knowledge of where my food has come from’, and ‘to support my local economy’, also score relatively highly for Dutch consumers, but only at 37%, 35% and 30%, respectively. This suggests that Dutch consumers are more sceptical about the empirical validity of claims connecting local food to positive outcomes for the environment and to wider economic benefits. This is again reflected in Figure 6.16, where more UK consumers (at

50%) believe they do have adequate information to establish the traceability of a particular product, compared to Dutch consumers (at only 41%).

Figure 6.15 Motivations for UFE consumers to buy local food

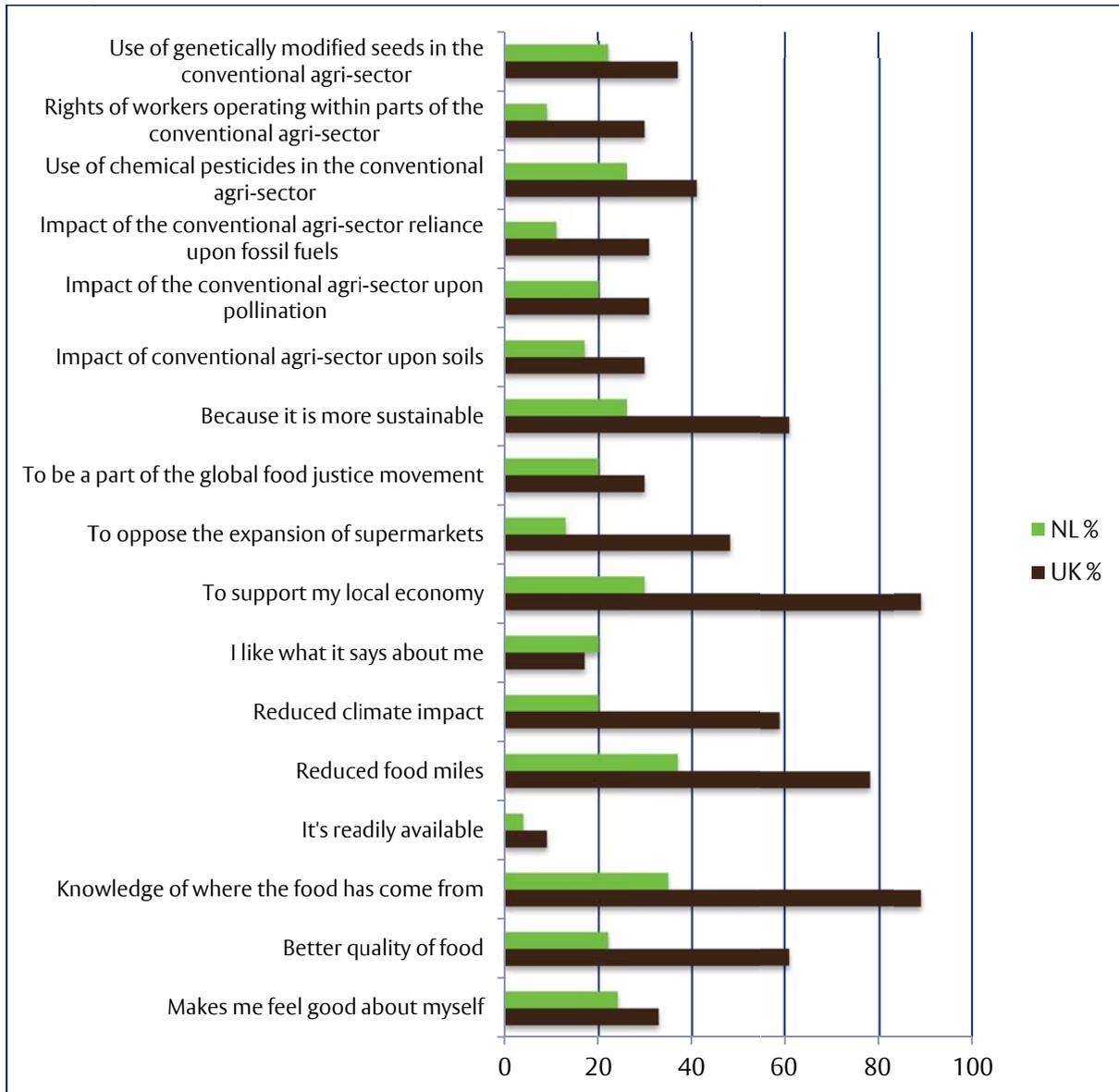
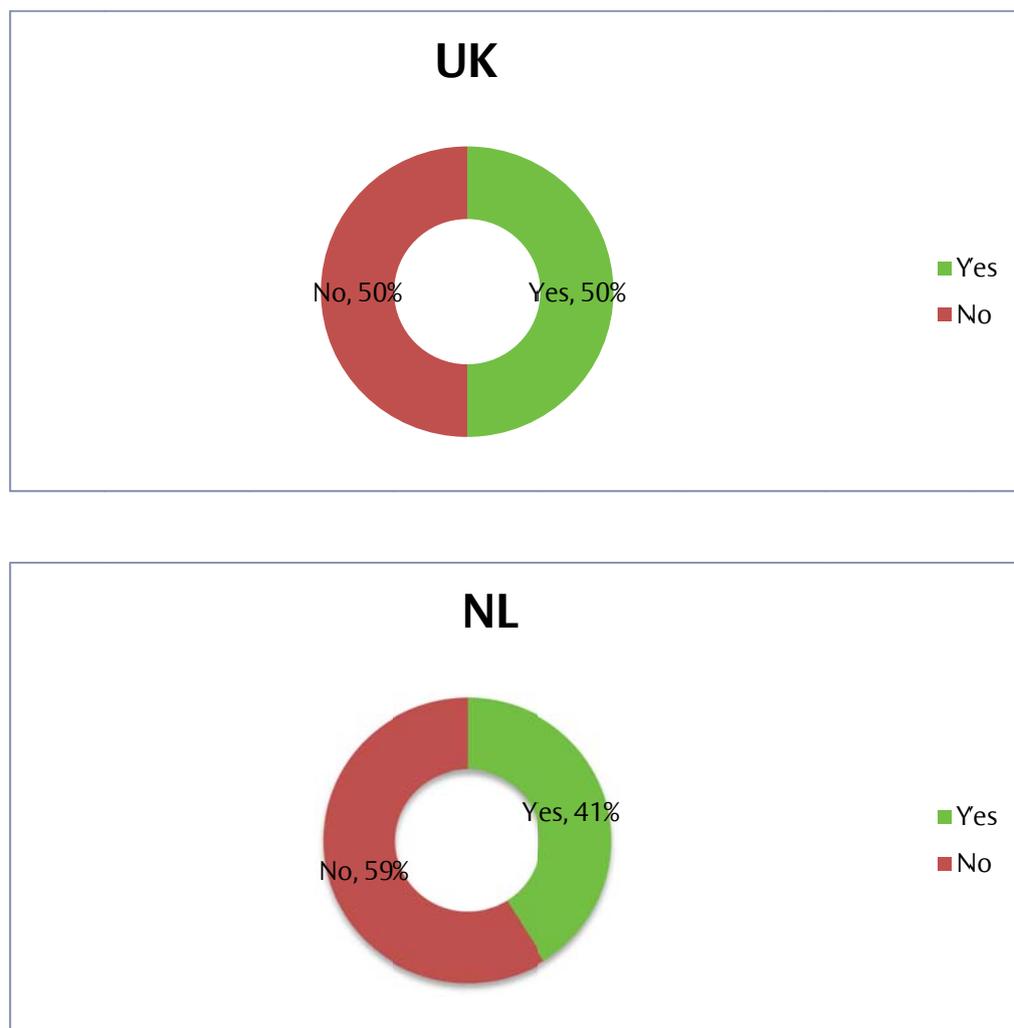


Figure 6.16 Percentage of consumers that shop with UFEs who feel they have the necessary information to be confident that local food is a sustainable option



6.4.3 Community Food Enterprise and consumer perceptions of climate impact

In addition to the questions examining the motivations UFE and consumer respondents, a question regarding their perceptions of the relative contribution to greenhouse gas (GHG) emissions of the different stages in the agri-food supply chain was also asked. Figures 6.17 and 6.18 illustrate the average rating attributed to different stages of the food value stream, by UFEs and consumers respectively, according to their contribution to GHGs. Nine signifies what is perceived to contribute the most, and one, the least. Both sets of respondents place agriculture, fertiliser manufacture and transport highly, followed by processing, packaging and waste disposal (although in the case of the latter two there is some disparity between UK and Dutch UFE respondents). Retail, catering and home related then follow, with UFEs seeing home-related emissions making a similar contribution as retail and catering, whereas consumers see home-related as of much less significance. This broadly fits with studies examining the contribution of the food sector to GHG emissions (see Chapter 3), with

agriculture contributing 80–86%, although it appears too high an emphasis is put on fertiliser manufacture and waste disposal, and relatively too little on packaging and retail.

Figure 6.17 Average rating (9 high, 1 low) on contribution to greenhouse gas emissions, as perceived by UFEs

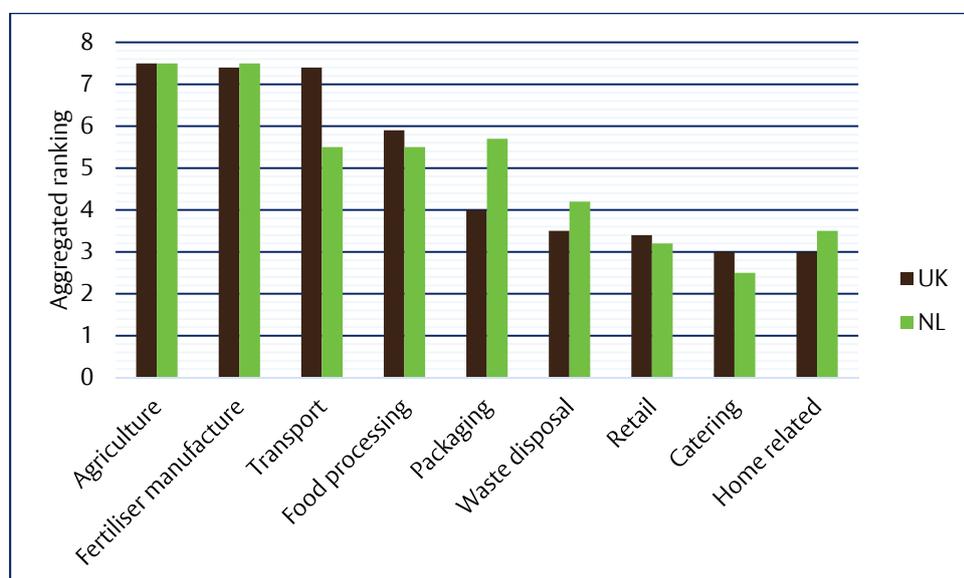
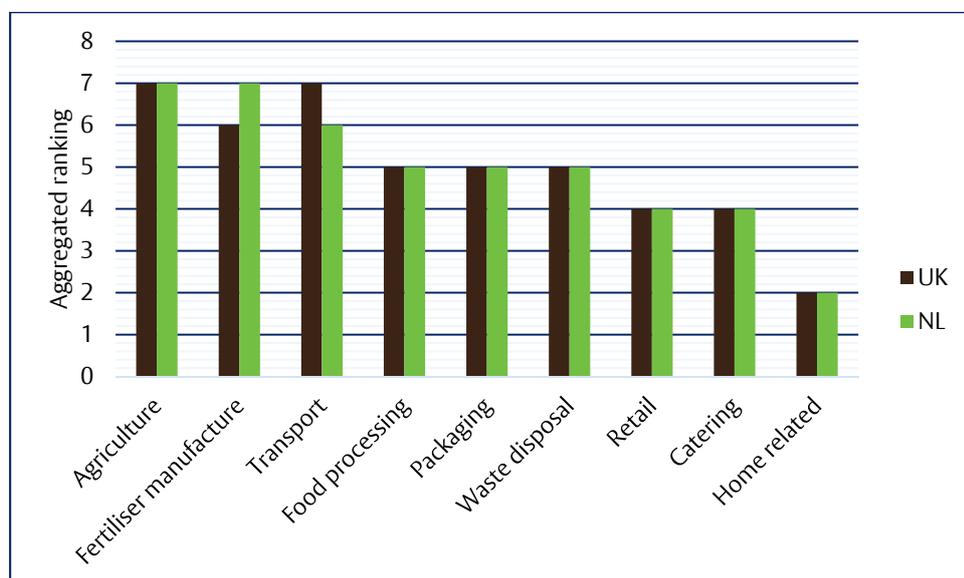


Figure 6.18 Average rating (9 high, 1 low) on contribution to greenhouse gas emissions, as perceived by consumers



6.5 Barriers faced by urban food enterprises and consumers

6.5.1 UFE barriers

UFE respondents were asked to highlight any barriers they have experienced to the development of their UFE, covering land use, technical barriers, market access, providing

convenience for the consumer, and policy constraints. For land use it was 'finding land initially' (2 respondents), security of tenure (2 respondents), knowledge of planning requirements and land contamination (1 respondent for each). Box 6.1 lists the technical and knowledge-based barriers, and then the barriers to market experienced by UFEs.

Box 6.1 UFE technical and market based barriers

Technical and knowledge-based barriers

- contaminated urban soil
- organic certification – certification body lacking in experience of certain scenarios
- taxation and general management of finances
- insurance
- lack of marketing expertise
- higher excise duties compared to other countries
- higher running costs relative to larger scale competitors able to take advantage of greater economies of scale
- knowledge-intensive processes that incur higher costs for (re)training
- capital intensive inputs and processes combined with low profit margins

Barriers to markets experienced by UFEs

- inability to compete with the economies of scale of mainstream competitors
- difficulty in achieving consistent supply of produce required by food buyers and restaurants
- consumer resistance to change in habits and lack of familiarity with local produce
- small potential market for produce
- difficulty entering an existing competitive market, particularly where buyers already have trusted suppliers
- pressure to develop a niche to be distinctive
- judging the value/price of products

UFEs were also asked if they felt their enterprises were disadvantaged by not being able to offer the same levels of convenience to consumers as supermarkets. 57% of UK UFEs and 83% of Dutch UFEs said yes. They were then asked what measures they had taken to mitigate this disadvantage; Box 6.2 details their responses.

Box 6.2 Mitigating access to market**Measures taken by UFEs to mitigate against the perceived disadvantage of not being able to offer the same levels of convenience as supermarkets.**

- place emphasis upon quality and ambiance as UFEs unique selling point
- provide consumers with a unique and quality experience
- review opening hours – remain open later and at weekends to provide convenience for consumers
- extend growing season by use of polytunnels
- attempt to educate potential consumers about the importance of changing consumption habits

In a follow up question, UFE respondents were also asked about the ways in which they tried to influence their consumer base (see Table 6.2).

Table 6.2 Ways in which UFEs seek to influence their consumer base

Message UFEs seek to communicate to their consumer base	Methods and platforms of communication
<ul style="list-style-type: none"> • The benefits to the environment of purchasing seasonal food • Benefits of buying local in terms of freshness of produce • Importance of minimising packaging • Potential of local food for reducing carbon footprint • Benefits of organic – absence of chemical fertilisers • Not to expect uniform size, shape and colour of fruit and vegetables • Importance of supporting local businesses for community cohesion • Encourage vegetable-based diets • Improve understanding of organic standards • Encourage co-operative ways of working • Provide community leadership and opportunities to local school groups • Importance of transparency in food production and personal contact/trust 	<ul style="list-style-type: none"> • Weekly email promotions and newsletter • Information in store • Social media • Website • Face-to-face discussion • Training sessions • Cooking sessions • Community leadership • Farm visits and other opportunities for school groups • Recipe book and website • Tasting sessions • Exhibitions and markets • Advertisements – local magazines • Appealing sales point with a large and broad range of products • Telephone contact

Finally, UFEs were asked to give examples of where policy has served to both aid and restrict the viability of their enterprise. Table 6.3 presents their statements.

Table 6.3 Urban food enterprises’ experience of policy

	Examples of where public policy has served to inhibit the viability of UFEs	Examples of where public policy has served to aid the viability of UFEs
UK	<ul style="list-style-type: none"> • Restrictions on the keeping of livestock within the city 	<ul style="list-style-type: none"> • Flexible rent agreement with local council • Reduced hire on council-owned venues • Council provision of free workshops and training for small businesses • Council provision of grant funding
NL	<ul style="list-style-type: none"> • Changes in alderman at local government level • Municipality does not act upon its promises • Difficulty in obtaining permits for renewable energy systems • Not policy as such, but the lack of administrative will to support local food projects with subsidies 	<ul style="list-style-type: none"> • Clear vision from the municipality (Floriade) that reflects the needs of UFEs and provides support where needed

6.5.2 UFE consumer barriers

For consumers, the main barriers to purchasing local food are ‘availability’ and ‘convenience’ in the UK, and ‘cost’ and ‘convenience’ for the Netherlands (Figure 6.19). For Dutch consumers specific emphasis is also placed upon the time and energy it takes to research and locate local food providers. Perhaps surprisingly, less emphasis is placed on seasonality, which is a likely influence for availability, convenience and cost. When asked whether they thought shopping at UFEs had increased their food bill (see Figure 6.20) UK UFE consumers were almost equally split (46% ‘yes’, 54% ‘no’), whereas the majority of Dutch consumers responded positively (83% ‘yes’) coinciding with their stated major barrier of cost. It is worth bearing in mind that the majority of shopping for both sets of respondents is still undertaken at the supermarket (Figure 6.21), and the average monthly food bill in the UK is slightly higher (Figure 6.22). Despite these responses on food cost and where consumers source the majority of their produce, the vast majority of participants would also like to see the procurement of local food integrated into public policy (Figure 6.23).

Figure 6.19 What consumers perceive to be the barriers to them purchasing local food

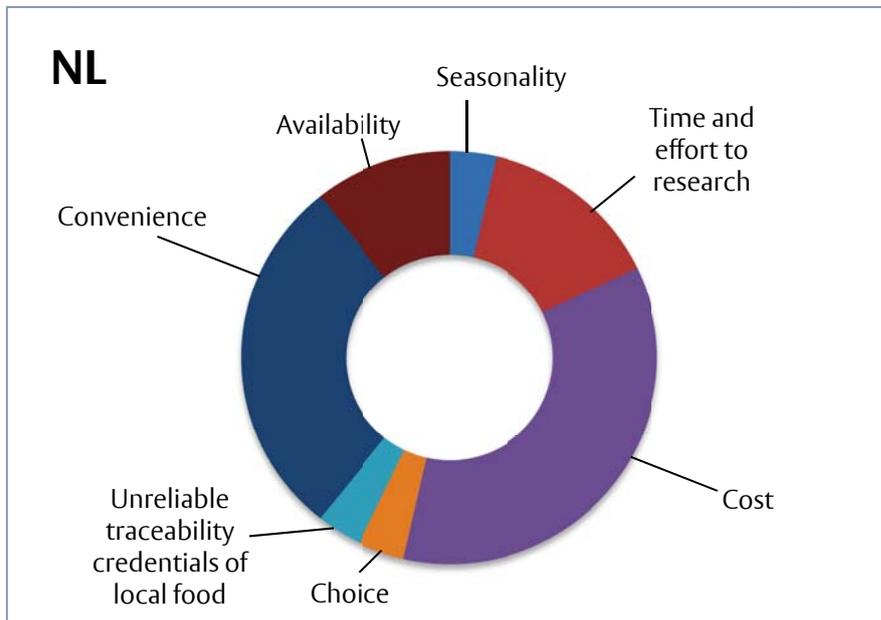
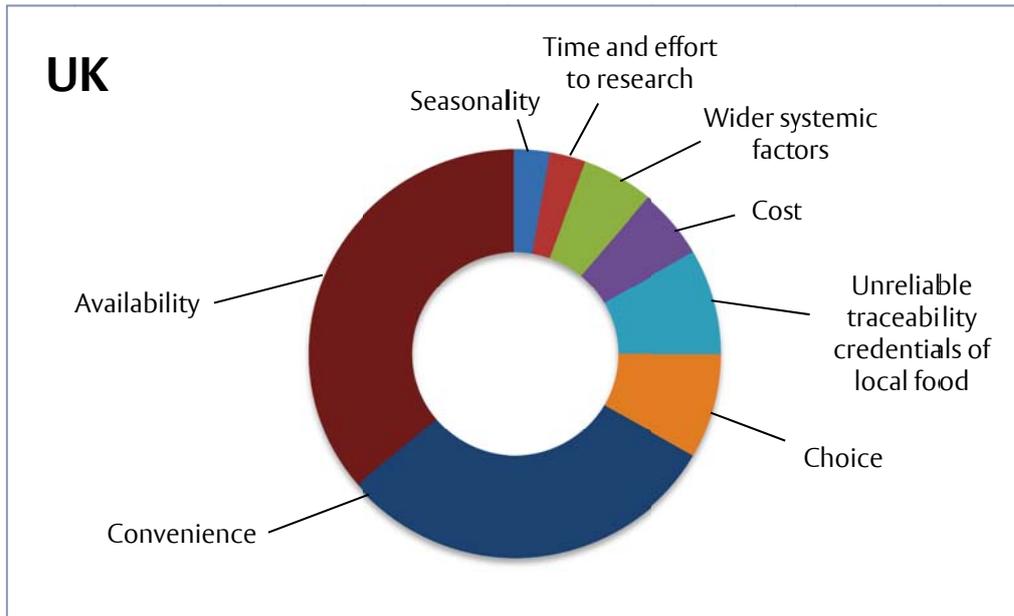


Figure 6.20 Percentage of consumers who shop with UFEs and believe that shopping with a UFE has increased the cost of their food bill

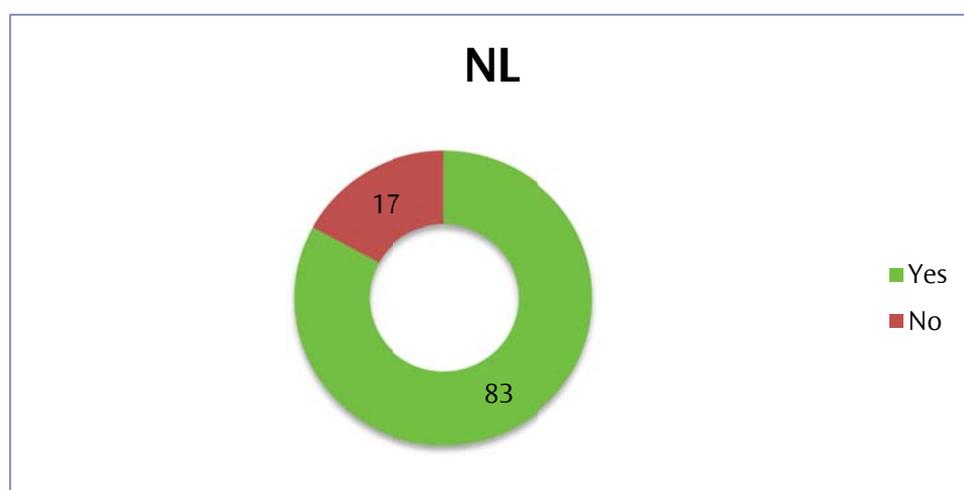
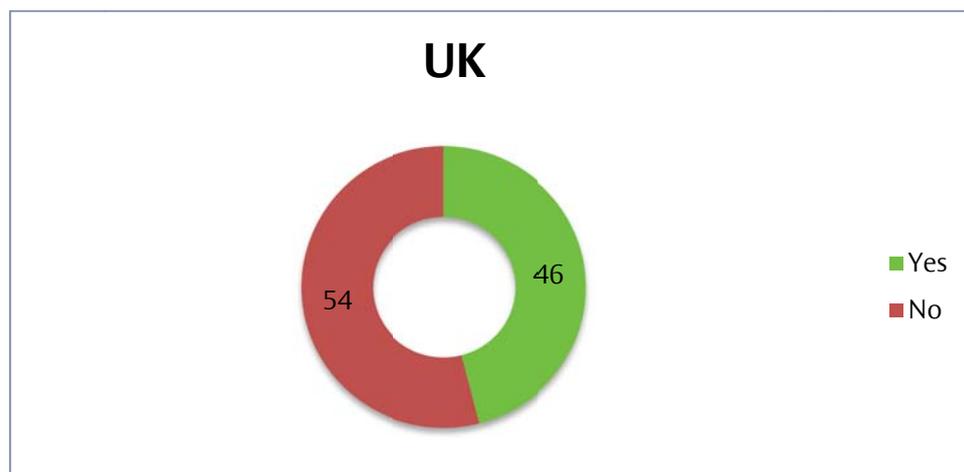


Figure 6.21 Percentage of shopping by UFE consumers across different retail formats

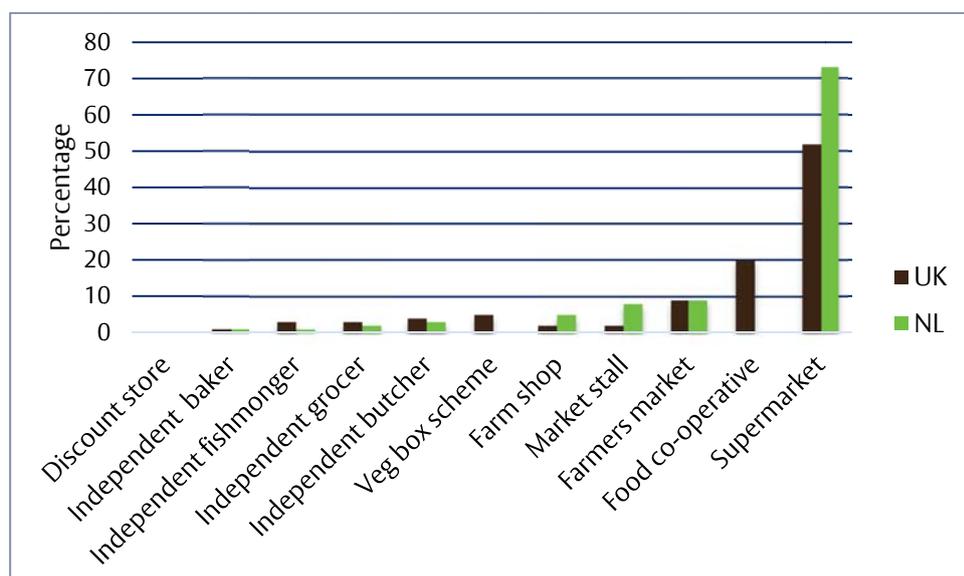
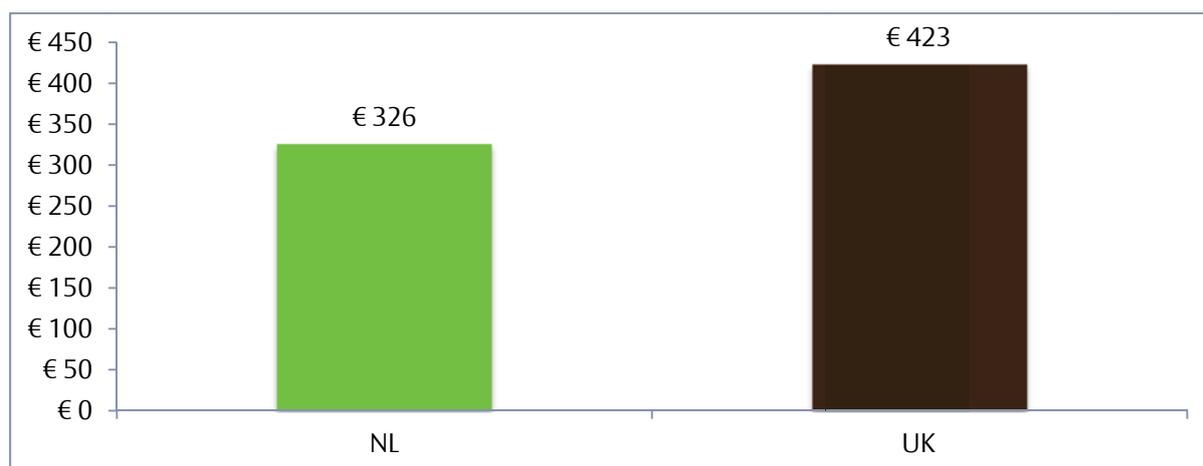
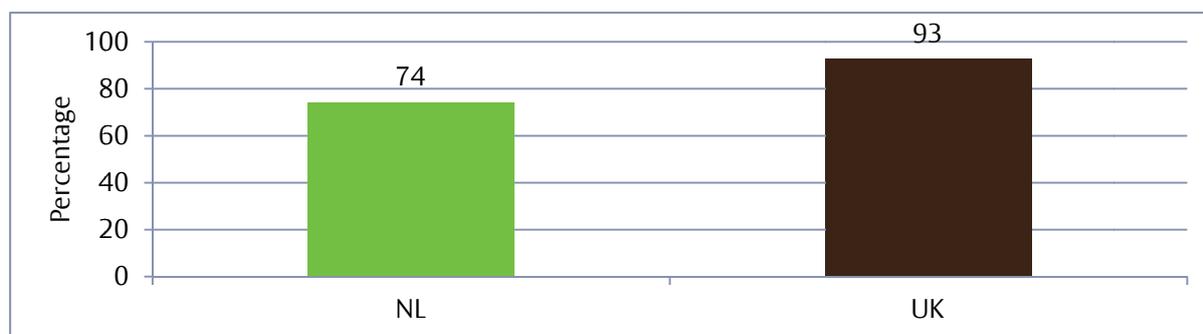


Figure 6.22 Average monthly food bill of consumers who shop with UFEs in euros**Figure 6.23 Percentage of consumers who shop with UFEs that would like to see procurement of local food increasingly integrated into public policy**

6.6 Summary

In summary, there were 14 respondents to the UFE survey, all of which could be defined as micro-enterprises. They are involved across the food chain in retail, then production, processing, and catering. The UK UFEs have a variety of legal structures, whereas the majority of Dutch UFEs were buying groups. Dutch UFEs relied on private investment, whereas UK UFEs benefited from grant funding, donations and also unpaid volunteers. The UFEs tended to produce, process and retail high valuable perishables. In the UK, produce tended to be retained within the urban centre, although the sourcing of products from outside was also evident. In the Netherlands, more produce was sourced from within the urban centre, including own produce, but then moved beyond the urban environment. Barriers faced included lack of business skills and issues in marketing.

There were 100 respondents to the consumer survey, 54 in the UK and 46 in the Netherlands. Motivations regarding food purchase focused on 'quality', 'health' and 'animal welfare', and for Dutch consumers 'affordability'; and in relation to purchasing local food,

'provenance' and 'supporting the local economy', as well as 'reduced food miles'. Barriers faced related to 'convenience' and 'availability', rather than 'seasonality' and 'choice', and, for Dutch consumers, 'cost'.

What is evident from these surveys is that, for UFEs to succeed there is perhaps a need to focus on the benefits to the local economy that UFEs could provide. Similarly provenance and seasonality of the produce is important to consumers, especially when related to how this affects quality. Perhaps less attention is need on the wider environmental benefits, including reduced food miles and climate impact.

7 Assessing the role of business incubators or accelerators and potential models

7.1 Summary of the workshop aims and approach

As mentioned in Chapter 1, workshops were held to discuss with both local and national stakeholders how a business incubator (network) could support economically viable urban food enterprises. Three workshops were held, one in the UK and two in the Netherlands. Of the two Netherlands workshops, the first focused on the success or failure of urban farming, and the second focused on the role of business incubators. During the project, the Dutch team concluded that the workshop focus should not be on business incubators only, but also, or instead, on business accelerators.

7.2 UK workshop (London, January 2015: 11:00–16:00) (A8.3)

Participants

Project team

Richard Nunes	
Alison Bailey	School of Agriculture, Policy and Development, University of Reading, UK
Alastair Clewer	School of Real Estate and Planning, Henley Business School, University of Reading, UK
Helen Wright	True Food Community Co-operative, Emmer Green, Reading, UK
Keith Heron	Centre for Entrepreneurship, Henley Business School, University of Reading, UK

UFEs and other stakeholders

Name	Organisation
Julie Brown	Growing Communities
Sara Smith	Environment Agency
Jonathan Lodge	City Farm Systems
Helen Wright	True Food Co-op
Natasha Harris	Field to Fork Organics
Kathleen Cassidy	Food Assembly
Ruth West	Funding Enlightened Agriculture
Sarah Williams	Sustain
Rachel Soloman	Global Generation

7.2.1 Workshop aims

The aim of the workshop was to encourage participants to think about what a potential ‘marketplace’ for their products might look like. We first focused on what it meant to be alternative, and how this sense of alterity or innovativeness is played out in their day-to-day practices. We then moved the discussion to identifying barriers and possible support mechanisms available to UFEs, future needs, and the potential role of business incubators (Figure 7.1).

7.2.2 Workshop outcomes

‘What does it mean to be alternative?’ and ‘How do you envision this alternative being played out?’

Participants were encouraged to return to what it is that deems their business/initiative alternative the first half of the day. They were split into two groups with large pieces of paper provided on each table for participants to note their thoughts individually.

‘What support is missing, but needed?’

These thoughts were then brought into the second half of the day where participants were challenged to think along more neoclassical economic lines about how they could grow not only their own business/initiative, but also grow as a business community. As participants were challenged to think about what this potential marketplace for their products might look like, many found their alterities consistently challenged and compromised when incorporated within a more neoclassical economic model – in particular the desire for their produce to be widely affordable (Figure 7.1). The participants were then brought back together and asked

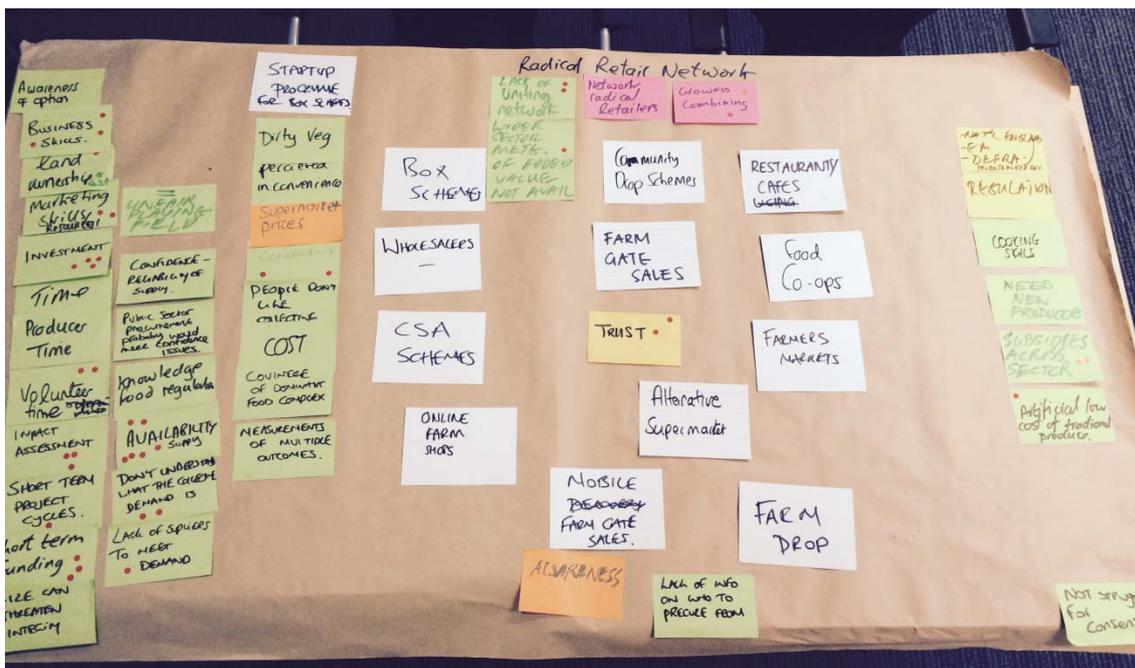
to highlight the barriers and opportunities to the realisation of their ideal marketplace, and what support structures might be put in place to help them access and grow this market.

Figure 7.1 An (alternative?) marketplace



The final activity for the day was a sense-making exercise – a tapestry of business models, opportunities and barriers (Figure 7.2). This resulted in a passionate exchange, with a number of secondary observations from participants as links between the different outputs from the day became more apparent.

Figure 7.2 Tapestry of business models, opportunities and barriers



Identified constraints and opportunities

The London workshop identified several constraints including the lack of business and marketing skills, the knowledge of food regulation, the access to land and investment, and the inability to demonstrate the value of UFE practices and outcomes for health and well-being, social cohesion and climate impact. Alongside the lack of a general shared knowledge of impact assessments, they also addressed wider ‘market place’ constraints such as: the convenience offered by supermarkets; the lower price of supermarket products for similar foodstuffs; consumer perceptions of dirty and misshapen produce; a lack of understanding of consumer demand for their sector; and the negative impacts of wider agricultural subsidies that artificially lower the cost of food and create an unfair playing field. Combined with short term project cycles, short term funding, and a lack of public sector procurement of their produce, the participants identified a need for better synergies between the insufficient supply of “alternative” food from “alternative” producers to meet the demands of “alternative” retailers’. However, it was stressed that these synergies are not possible without addressing structural challenges around the lack of knowledge and market mechanisms that restrict the market place for small holder farmers and the links to UFEs in the city. The main constraints and opportunities for the above-mentioned goals are listed in Table 7.1

Table 7.1 Constraints and opportunities

Constraints	Opportunities
<ul style="list-style-type: none"> • Lack of business skills • Lack of access to land • Lack of marketing skills • Difficulties accessing investment • Lack of volunteer time • Lack of impact assessments • Short-term project cycles • Short-term funding • Lack of public sector procurement of their produce • Lack of knowledge of food regulations • Lack of understanding of the collective demand for their sector • Insufficient supply of 'alternative' food from 'alternative' producers to meet demand of 'alternative' retailers • Consumer perceptions of dirty/misshapen vegetables • Supermarket prices undercutting their produce • Convenience offered by supermarkets • Higher cost of alternative produce • Inability to demonstrate value of wider outcomes for health and well-being, social cohesion and climate impact • Shortage of skilled cooks to produce secondary products • Overemphasis upon selling of raw produce – not enough secondary products • Wider agricultural subsidies creating unfair playing field and artificial low cost of food produced by the industrial food complex 	<ul style="list-style-type: none"> • Trusted brands • Knowledge of where food comes from • Consensus on values – stronger together • Social exchange experience – bypass direct price comparison • Political lobbying – directed at curtailing dominant industrial food complex to create more space for alternative market • Job creation and community economic development – a potentially valuable sector for the economy as a whole • Wider social–environmental benefits, but value needs to be attributed to them • Encouraging the public procurement of regional produce from small holder farmers and/or via UFE networks

What can be the role of a business incubator?

This is a tall order for a business incubator, but one that should encourage multi-dimensional, inter-sectoral and cross-scalar engagement toward reinforcing city-regional food economies. The workshop participants suggested several opportunities that could be addressed by an incubator and/or accelerator of UFEs. The suggestions included opportunities such as: the generation of trusted brands; job creation and community economic development; attributing value to wider socio-environmental benefits; encouraging the public procurement of regional produce from smallholder farmers and/or via UFE networks in the city; and lobbying on behalf of UFEs to generate greater market share.

7.3 Workshop I in the Netherlands (Almere, October 2014: 13:30–16:30) (A8.4)

Participants

Project team

Gerben Mol (project coordinator)	
Arjan Dekking	Alterra, OSA
Suzanne van der Meulen	Deltares
Gerda Lenselink	Deltares, Buitenstad

UFEs and other stakeholders

Name	Organisation
Gaston Remmers	Bureau Buitenstad
Karin van den Brand	Platform Eetbaar Amsterdam
Tanja den Broeder	Platform Eetbaar Amsterdam
Frank Bakkum	Gemeente Amsterdam
Wouter Baack	Gemeente Almere
Linda Boutt	Gemeente Almere
Tineke van den Berg	Stadsboerderij Almere
Monique Seijnen	Voedselcollectief Regelrecht van de Boer
Dinand Ekkel	CAH-Vilentum
Marc Buiter	Urgenda
Roelof Balk	Noorderwold, Slimmevos.nl
Angela Manningsveld	Groentje Cider

7.3.1 Workshop aims

The aim of the first workshop held in the Netherlands was to determine success factors and constraints for the practical implementation of urban farming in Almere in order to accelerate and upscale commercial exploitation and contribute to climate mitigation and/or adaptation simultaneously.

As a result of this process it was envisaged that Canvas Business Modelling would identify two or three potential business incubators for Almere, for further development in the second workshop. Experiences from Amsterdam were used for reflection and inspiration.

7.3.2 Workshop outcomes

What is meant by ‘accelerating local food enterprises’?

Participants explained what they saw as required developments for local food systems:

- development of sustainable (as in persistent) organisations that are economically independent
- increase the societal impact (including economic benefits, health, social cohesion, climate, good urban environment) of local food systems
- enlarge the market for local sales

When it comes to scaling up, participants stated the following:

- not to ‘scale up’ per se, but to ‘scale out’ too
- scaling up is required to create sustainable, economically independent enterprises

Identified constraints and opportunities

The main opportunities and constraints for the above-mentioned goals are listed in Table 7.2.

Table 7.2 Constraints and opportunities

Constraints	Opportunities
<ul style="list-style-type: none"> • Limited availability of land** • Many small, vulnerable initiatives • The municipality overburdens enthusiasm • Agreements concerning management between initiatives and the municipality are a constraint • Municipalities face fiascos • The authorities are not capable of loosening control • Access to market: municipalities give existing big supermarket chains an advantageous permit to establish supermarkets in new residential areas; a local food store does not get this special treatment • Lack of co-operation in visioning • Lack of a strong urban food vision • Lack of co-ordination between initiatives and between initiatives and the municipality in implementation • A lot of money and energy is spent on small initiatives • Pioneers do not co-operate • The current food system (including transport, waste handling, shops and food prices) has existed for a long time, is successful and strong; it is difficult to change that • Urban farming is widely judged as tinkering on the edges, it is considered that such a local system cannot feed the population • Public fear of the health risks of urban farming products 	<ul style="list-style-type: none"> • Local products are more than just food; we sell a story* and this enables a higher profit margin • Existing initiatives and knowledge • Franchise structure • Increase efficiency by collaboration • Climate adaptation: choose crops that contribute most to climate adaptation; Almere wants to hand over green areas • Some existing shop owners see added value of local food enterprises and welcome them in their shopping streets • Economic recession leads to a need for change • Unused buildings
<p>* Result from both questionnaire surveys among entrepreneurs and workshop</p> <p>** Result from the questionnaire survey among entrepreneurs</p>	

What can be the role of a business incubator?

Participants frequently mentioned the issue of co-operation.

It also was stressed that co-operation should not become a goal in itself but, for the following required actions (Box 7.1), local food initiatives could be stronger or more efficient if they team up.

Box 7.1 Actions for which cooperation would be beneficial

- Knowledge development, especially on new financing mechanisms.
Function as lever for establishing new financing mechanisms.
- Development of a local food vision.
- Remove practical constraints that originate from the relation between food enterprises and the municipality.
- PR to the general public, marketing.
- Logistics, both in a physical place and in a network: linking demand and supply, and distribution.

Parties that are needed (in some way) in the co-operation network include urban farms, regular farms, local restaurants, the municipality, knowledge institutes, health shops (natuurwinkels), financiers and citizens.

We determined from the discussions that knowledge development (especially on new financing mechanisms) and developing a local food vision are the immediate goals for a UFE business incubator, and that enlarging the market and (to some extent) scaling UFEs up and/or out, are the accompanying means to achieving these ends.

Box 7.2 A good foundation for business incubators

- A **physical place** (e.g. a 'hub', market or place in a supermarket)
- An **organisational body** (e.g. a food board)
- A **professional organisation**; a business incubator will not survive if it depends entirely on volunteers
- A **contact person**, someone who is approachable and recognisable.

Participants stated that existing networks, locations and people could provide a good basis for business incubators.

The function of these existing networks in Almere is connecting local food enterprises with each other and with the municipality. One organisation, Heidemij, is also offering financial support.

Some participants stressed that the incubator should not be linked to chambers of commerce because these types of organisations lack inspirational power.

7.4 Workshop II in the Netherlands (Stad en Natuur op de Kemphaan Almere, December 2014: 13:30–16:30) (A8.5)

Participants

Project team

Gerben Mol (project coordinator)	
Arjan Dekking	Alterra, OSA
Suzanne van der Meulen	Deltares
Gerda Lenselink	Deltares, Buitenstad
Rutger van der Brugge	Deltares
Tijmen Altenaar	Business coach, IDfuse

UFEs and other stakeholders

Name	Organisation
Gaston Remmers	Habitus Gebiedsontwikkeling
Wouter Baack	Gemeente Almere, groenadviseur
Tineke van den Berg	Stadsboerderij Almere
Hans Goudriaan	Rozenkwekerij Goudriaan, voorz LTO Almere
Marita Goudriaan	Rozenkwekerij Goudriaan
Monique Seijnen	Voedselcollectief Regelrecht van de Boer
Marc Buiten	Urgenda
Roelof Balk	Noorderwold, Sluwe Vos
Angela Schepers	Groentje Cider
Jan-Eelco Jansma	WUR
Hillebrand Koning	Provincie Flevoland; Floriade werkt
Remco Hafkamp	Link to Liek

7.4.1 Workshop aims

The aim of the second workshop was to further explore the services that a business accelerator could offer its clients.

7.4.2 Workshop outcomes

The programme consisted of two parts. First, participants were introduced to the programme and given a presentation of the results of workshop 1. This was followed by inputs from a professional business coach. A 'value proposition model' was used to identify the aims of the urban food enterprises (their 'jobs'), the most pressing 'pains' that hamper their success, the amount of money that is related to these pains, the service that could alleviate the pains and the mode of payment for this service. The detailed programme of the workshop is provided in A8.3.

A selected group of potential clients for the accelerator was invited to the workshop, as were civil servants involved in programmes with urban farming ambitions and experts on financing mechanisms.

Picking up where we left off in workshop 1 (Almere, October 2014: 13:30–16:30)

The following section provides an overview of workshop 2 outcomes, identifying participants' propositions of the potential value to be added by a business accelerator, before identifying perceived constraints and opportunities of its implementation. The aim for the future marketplace of urban farming in Almere is to have economically healthy urban food enterprise. The aim of this workshop was to find out how a business accelerator could support and accelerate this development.

Incubator or accelerator?

The project team used the term *business incubators* a lot during this project. However, based on discussions with the business coach who was involved in the project, it was decided that *business accelerator* was the correct term for what we meant. A business incubator focuses on start-ups, while an accelerator (also) supports existing businesses.

Existing organisations and networks in Almere and elsewhere in the Netherlands already function as accelerators. Some urban food enterprises themselves also function as accelerators.

What are the value propositions for a business accelerator of urban farming?

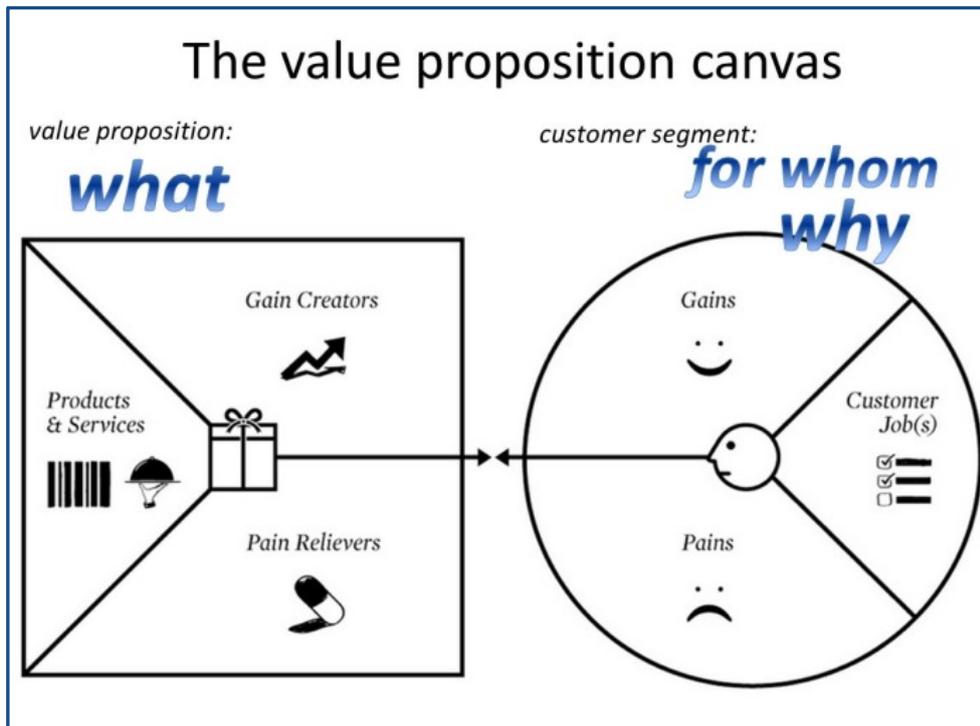
Climate-KIC business coach Tijmen Altena presented the common role of a business accelerator and business models for the accelerator. The main function of an accelerator is to empower entrepreneurship. Two main business models exist:

Facility model. The accelerator provides to its customers accommodation and sometimes also services. Customers pay for this. Examples in the Netherlands are UtrechtInc and Yes!Delft.

Participation model. The accelerator has a share in the companies that it supports and earns from the companies' successes. An example is Y Combinator in the United States. This accelerator is so successful that being included in their programme is a 'stamp for success' for companies.

The payment by the customers of the accelerator can comprise alternative rewards, such as no cure–no pay or in-kind contributions. In order to find the proper package of services that an accelerator can provide, the value proposition canvas model would be used. Tijmen Altena explains the model in Figure 7.3.

Figure 7.3 The value proposition canvas



Customer segment
 Per customer job, the jobs that the client of the accelerator has to fulfill, the main opportunities (gains) and bottlenecks (pains) are identified.

Value proposition
 The products and services provided by the accelerator to optimise the exploitation of opportunities (gain creators) and reduction of threats (pain relievers).

(Source: Osterwalder, n.d.)

The value proposition canvas model was used to help define potential products and services of an accelerator for two different client groups, the results for which are presented below (Figure 7.4, Figure 7.5).

Figure 7.4 Value proposition in relation to macro-scale urban food enterprises

Macro, job A: Improve link between producers and consumers

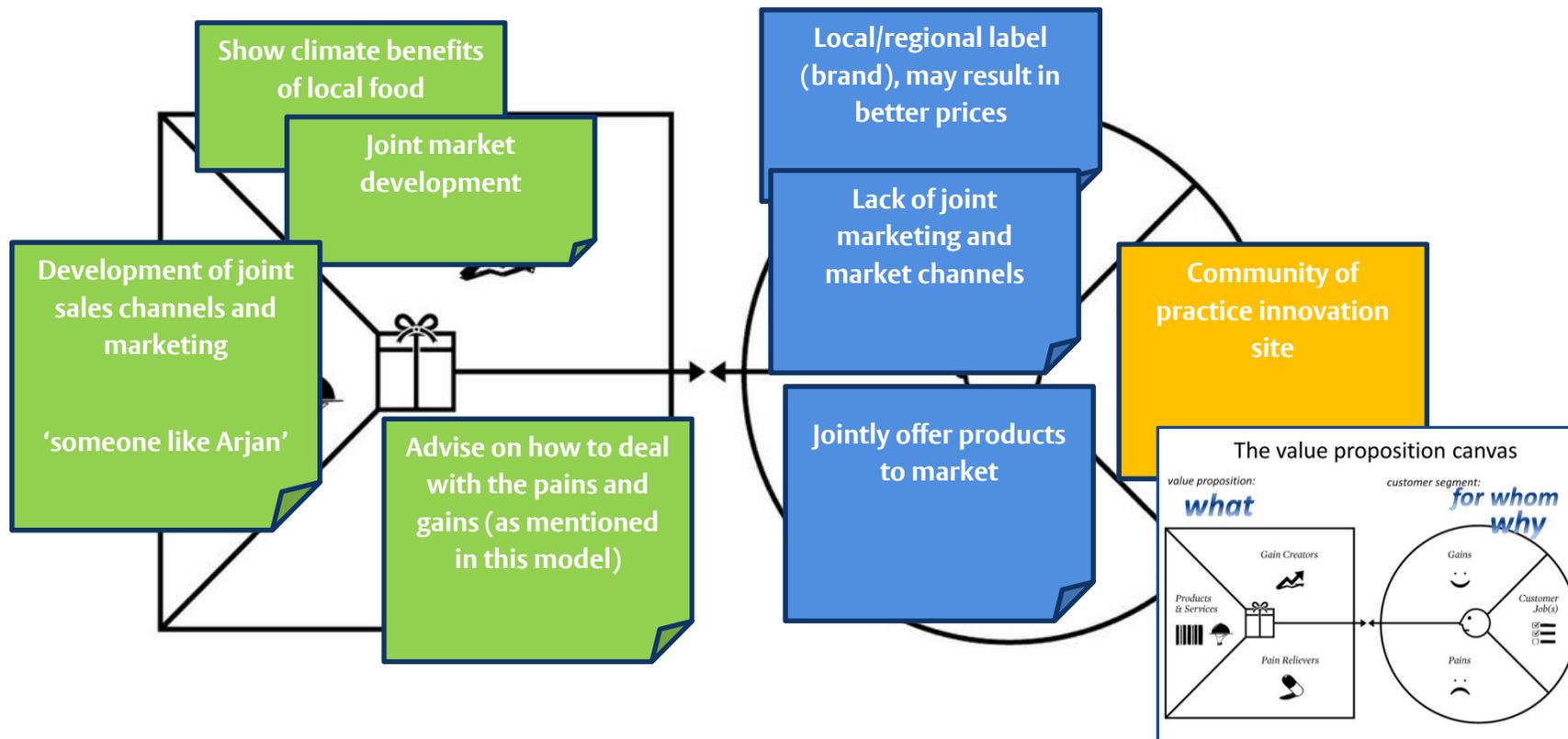
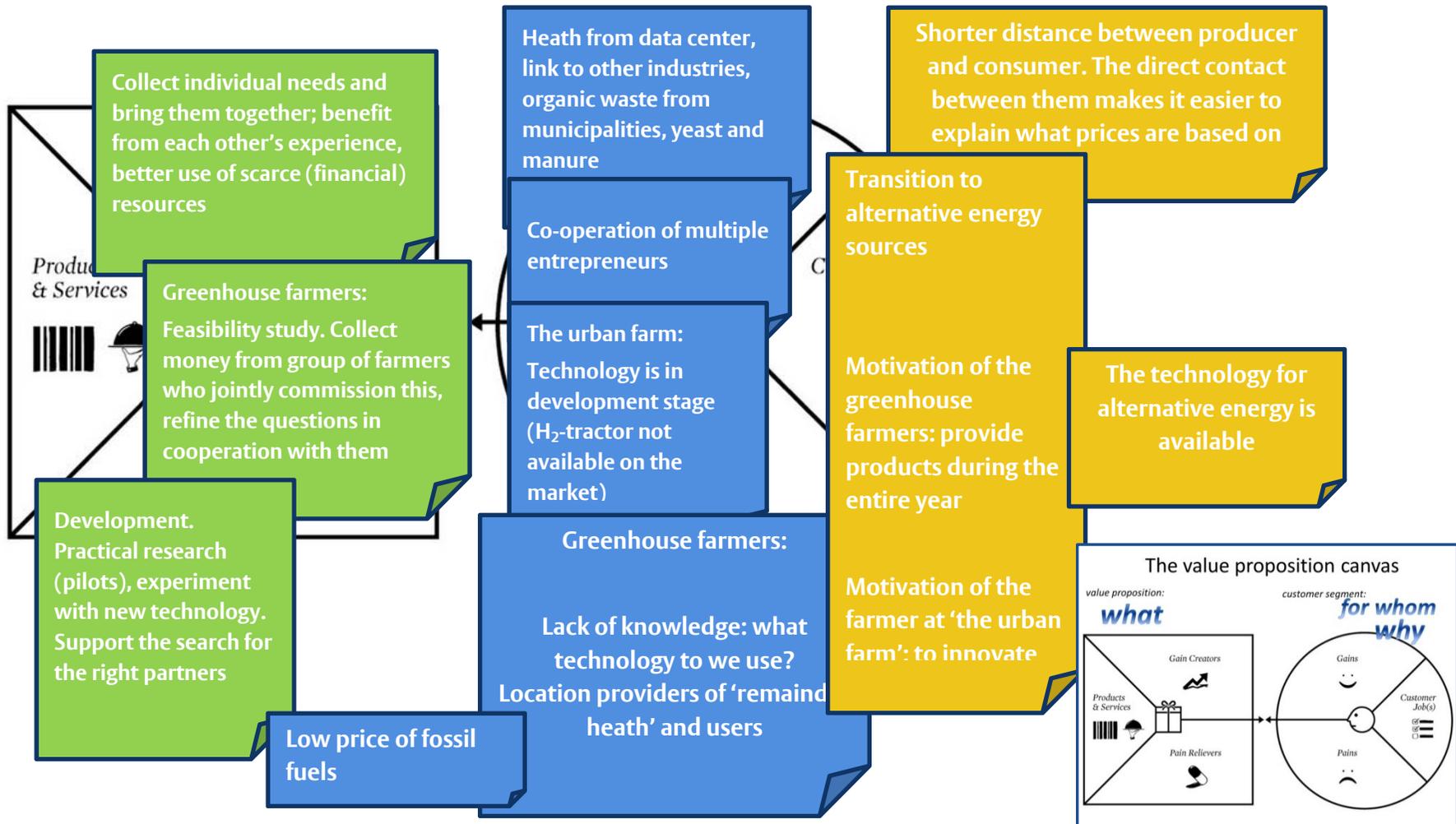


Figure 7.5 Value proposition in relation to macro-scale urban food enterprises

Macro, job B: Transition to alternative energy sources



Identified constraints and opportunities

The group consisted of entrepreneurs with small companies that were developing new and unique business activities. Their business concepts were individually unique, but they all related to food production (cider, strawberries), perception and knowledge exchange. The group identified constraints and opportunities that hamper or support the entrepreneurs in their fledgling business activities, and what a UFE accelerator could offer to help relieve these pains or benefit from the gains. The results of the discussion are summarised in Table 7.3.

Table 7.3 Constraints, opportunities and the potential role of a UFE accelerator

Constraints	Opportunities	Potential role of an accelerator
Lack of knowledge and experience for writing a concrete business plan		Assistance for business plan development; offer business coaching (high cost); engage wider business community, including retired professionals (low cost)
Getting stuck in the official process		Broker communication between companies and the municipality
Lack of knowledge of criteria for getting a permit		Broker communication between companies and the municipality
Not able to comply with the requirements of banks (e.g. for loans)		Provide support, but also lobby for new financing mechanisms
Lack of access to land		
	Food vision	Collaborate in the development of a municipal strategy
	To provide possibilities for experimentation by favourable start-ups	
Problems finding a market		
Lack of reputation/known brand name	Joint branding	Develop a brand

7.5 Summary

To draw this chapter to a close, some of the key messages that emerged from the workshops are highlighted here; they are more fully discussed in the following concluding chapter. The workshops point to a lack in business skills, and new demands for training and support in areas such as branding and marketing, business plan writing, coaching and financing. There is also a call for new market creation (with its associated land and market access challenges) as well as a call for greater cooperation of local and national stakeholders.

8 Conclusions

8.1 Conclusions

Our research findings suggest the need to address complex policy interrelationships surrounding the development of urban agriculture practices, involving economic, social and climate aspects of policies in cities and their surrounding areas.

At this city-regional level, a complex systems appreciation of the interconnections between food systems and other urban systems, such as (food) waste to energy and/or composting streams, will be required. The business case that underpins this call for multi-level, cross-border, inter-sectoral synergies is one of circular economies and ecosystems services. It is a business case that must equally take into consideration pre-existing issues surrounding the uneven distribution of ecological assets (and their social returns), and the disproportionate environmental burdens among economically disadvantaged urban residents.

8.2 Climate benefits and environmental challenges related to urban food systems

The climate benefits that are often mentioned with regard to urban agriculture concern the sharing and reuse of wastewater, and the reuse of organic waste streams and its interconnection with energy streams. Although the possibilities are theoretically endless, evidence from practice confirms that practical barriers prevent the realisation of these benefits.

The reduced mileage argument is a climate benefit that has been widely discussed in the academic and policy literatures. For various reasons this argument is less convincing than it seems. First of all, transport is only a minor contributor to the overall GHG emissions of agro-production. Secondly, the literature shows both positive and negative outcomes on the impacts of transportation and energy efficiency in shortened food chains; the latter refers to shortcomings in structural logistics optimisation (i.e. small vehicles, low volumes, many individual routes, and points of sale). Therefore, locally produced food does not automatically lead to a decrease of 'food-kilometers' or 'food miles'.

With regard to the adaptation of cities to climate change we have considered two aspects of urban agriculture: managing water in the city and managing the temperature of cities. There is a growing body of literature that indicates that urban agriculture, both in open soil and on vegetated roof tops, can be beneficial for retaining water effectively after storm events, and thus reducing the immediate runoff to the sewers. This helps prevent pollution events related

to runoff exceeding urban sewerage capacity. Urban agriculture can also make a positive contribution to mitigating heat island effects. Altogether, these benefits rely on the inclusive design and delivery of 'green' infrastructure, as well as the ability to identify 'healthy soils', the (negative) effect of reduced solar radiation on plant productivity, and the potential risk of contamination to water and soil resources from the use of organic waste.

Business opportunities arising from urban environmental challenges include:

- Locally available soil amendments through the use of composted food scraps, manure, approved biosolids, and lawn-based mulches, which can be used to improve soil quality, fertility and tilth, and hence the agricultural production capacity of urban soils.
- The use of municipal waste products to improve soil health can reduce processing and transport costs associated with disposal. This may offer a value proposition to urban agriculturalists as buyers of municipal waste.
- Non-food horticulture by UFEs in contaminated sites could offer a value proposition to city governments as part of phytoremediation strategies and solutions for the storage and buffering of contaminated storm-water runoff.

Our survey findings suggest that there are distinct differences between London /Reading (UK) and Almere (NL) with regard to food purchases. UFE consumer motivations for purchasing from UFEs do include transport ('food miles') and its climate impact in both countries, but in the UK the emphasis is more on local economy and provenance, whereas the price and cost of foodstuffs are factors that hold greater weight than that of the environment for consumers in Almere.

8.3 Opportunities and bottlenecks for UFEs

The opportunities for UFEs relate to a mix of economic, and social, environmental and food justice motives that they selectively draw upon for embarking on their venture as an enterprise, and that motivates them throughout the process of 'doing business'. Their primary objective is not to produce profit for shareholders, but to provide products and services in a manner that is socially and ecologically sustainable; they offer an alternative to the current food system as a means to addressing wider social issues, including but not limited to food poverty, obesity, and the barriers to food access and choice over nutritious quality food and its causes. This emphasis on 'local' foods, which can engender a greater sense of transparency, accountability and the interaction between producer and consumer, led our London focus group participants to define *trust* as the unique selling proposition

(USP) of local food. The project also identified particular challenges for urban and regional strategic planning in both countries. These challenges include: the creation of local jobs, with an attention to neighbourhood-level entrepreneurship and economic development, especially among economically disadvantaged urban areas; the range of unique local food initiatives that emerge from and motivate processes of community development and urban regeneration across diverse urban communities; and the creative reuse of unused spaces and buildings.

For many UFEs, their concern with a lack of economies of scale and a lack of market access only stretches so far as to ensure their commercial viability. In part, this could be causing, or at least may not be helping to ease, some of the bottlenecks encountered by many UFEs. Some of the crucial bottlenecks that this study has identified are the lack of entrepreneurial skills, the lack of access to finance, the lack of access to land, and the lack of a common marketing and sales channel. Other bottlenecks, which are less easily influenced by UFEs, include: policy barriers (regulations concerning soil pollution, food and sanitary standards, or on-site processing); increased competition from supermarkets selling 'local' products; and the urban engineering skills and knowledge necessary to reap the potential climate benefits of linking the food cycle to (waste) water, organic waste and energy streams at the city-regional level.

8.4 Roles and business models for business incubators and accelerators

As indicated above, there are significant differences in how UFEs are financed. Whereas many UFEs in Almere must turn a profit to stay in business and to repay bank loans and other forms of private investment, there has been far greater access to public funding and donations in London and Reading. Also, the motivations of UFE consumers in these cities differ significantly. The price of foodstuffs is of particular concern for UFE consumers in Almere, while London and Reading consumers place it secondary to a wider localism agenda. In fact, the Dutch consumers in Almere appear more sceptical regarding claims that local food produces benefits for the environment.

These local differences in both countries have implications for the roles business incubators and accelerators should play. First of all, the workshop results from this study suggest that their role should be defined locally because the circumstances and needs of communities are locally determined. We are particularly reminded of the importance of *trust* in this regard, of transparency, accountability and the interaction between producer and consumer.

Secondly, business accelerators could provide mentoring and entrepreneurial skills development and access to resources. This could involve support with: obtaining funding to start a business; coaching on how to start with an aspect of the business that will generate early revenues to boost its further development; realising meaningful cooperation in a city-regional food system by encouraging complementarity across production scales and a diversity of production practices; developing a common marketing approach and retail network for urban and smallholder farmers; establishing institutional markets through public sector food procurement arrangements; and with lobbying the business case for urban/peri-urban access to land, as well as the case for food and nutrition security. These areas of improvement have been indicated by the outcomes of both the literature survey and the interviews and workshops of this pilot study.

Our research findings also point to networks or organisations that already exhibit the characteristics of a UFE incubator or accelerator in Almere and London. Examples include the Association Buitenstad and the Development Centre for Urban Agriculture Almere (OSA) in Almere, and Urban Food Routes (Plunkett Foundation) and Capital Growth in London. In different ways they provide a vision on local food, act as a network contact for municipalities, engage civic events and raise the profile of urban food enterprises, and offer a platform for networking and knowledge transfer. Needs expressed during the workshops and interviews that are not (yet) provided include:

- knowledge development, especially on new financing mechanisms
- leveraging and establishing new financing mechanisms
- providing a physical place or hub where demand and supply can meet, where the logistics of distribution can be organised, and where expertise can be exchanged

Once more, the place of the UFE incubator or accelerator lies at the centre of complex, cross-sector policy interrelationships and a diverse collection of community-based initiatives in any one locality. There is a need for brokering knowledge exchange within and between these policy and civic arenas, and their wider networks. This requires an approach where volunteers and professionals, working together for an incubator/accelerator, can act as serious complementary counterparts to other stakeholders in this complex field of play.

Appendices

A8.1 Urban Food Enterprise Survey

July, 2014

Dear Sir/Madam,

'Cities on the Grow' survey of Urban Food enterprises and Local Food Systems

We are currently conducting a study of local food systems and attitudes towards local food. For this study we are asking members/employees of Urban Food Enterprises (UFEs) to give us their views on local food systems by completing an online survey. For the purposes of this survey we are asking participants to note the following:

- References to 'city' in the survey refer to the case study cities of Amsterdam, Almere and London, and the town of Reading inclusive of all districts or boroughs within the case study cities; and
- Many attempts have been made to define what constitutes a local food system and this remains a contested space. We ask that prospective participants only complete the survey if the UFE they are a consumer with is located in, or within a 30-mile radius of the edge of their respective case study city.

Participation in the study is voluntary. Though if you could spare some time to complete this questionnaire, it would be greatly appreciated. It should take no more than 15 minutes of your time to complete. The research is part of a wider project entitled 'Cities on the Grow'. This is a collaborative research project between the University of Reading, Wageningen University and the Deltares Research Institute. All results of this project, which is funded by the European Institute of Innovation and Technology as part of the Climate Knowledge and Innovation Community (Climate KIC), will be publicly available on our website in the Spring of 2015.

We can reassure you that all your answers and responses to this questionnaire will remain anonymous and confidential as no question asks for your identity or full address. By completing the questionnaire you are acknowledging that you understand the terms of participation and that you consent to these terms. This project has been subjected to ethical review, according to the procedures specified by the University of Reading Research Ethics Committee, and has been allowed to proceed.

From all of us on the project team at 'Cities on the Grow':

Thank you very much for your help in carrying out this research. If you have any queries, please do not hesitate to contact us at project.team@citiesonthegrow.org

Consent to Terms and Conditions

1. I have read and understand the above Information Sheet relating to the project on: 'Cities on the Grow'
 2. I have had explained to me the purposes of the project and what will be required of me, and any questions I have had have been answered to my satisfaction. I agree to the arrangements described in the Information Sheet in so far as they relate to my participation.
 3. I understand that my participation is entirely voluntary and that I have the right to withdraw from the project at any time, and that this will be without detriment.
- I agree to these terms and conditions

If you do not agree to these terms and conditions please do not go on to complete the rest of the survey

- Q1 Please add the year that your UFE was founded using the drop-down box below.
- Q2 What was the legal structure of your UFE upon start-up?
- Q3 What is the current legal structure of your UFE?
- Q4 Has your UFE experienced any periods of closure between the date the UFE was founded and the present day?
- Q5 Please give details of the length and reason for this closure.
- Q6 What is the average annual turnover of your UFE?
- Q7 Please indicate your UFE's source(s) of financial investment upon start-up. You may select multiple options if investment came from multiple sources.
- Q8 Please give details of your UFE's current revenue streams.
- Q9 Has your UFE chosen to diversify its revenue streams to ensure its commercial viability?
- Q10 Please explain how your UFE has diversified its revenue streams.
- Q11 Which categor(ies) would you consider the activities undertaken by your UFE to fall under? You may select more than one. (For example, you might be a grower but also sell your own produce, therefore you would select primary production and food retail).
- Q12 Please indicate what food product(s) your UFE specialises in producing.
- Q13 What type(s) of land does your UFE operate on? If multiple, please feel free to select more than one option.
- Q14 How many locations/plots does your UFE currently operate from?
- Q15 What do you estimate to be the total size of your UFE's plot(s). Please indicate in either acres or m².
- Q16 Has your UFE changed the use of any of its land throughout its tenure?
- Q17 What were the changes that were made?
- Q18 Did your UFE experience any complications in securing this change of land use?
- Q19 What is the nature of the tenancy agreement for the plot(s) of land your UFE operates from? If multiple, please feel free to select more than one option.
- Q20 Please describe the arrangements of the agreement for your temporary land use.
- Q21 How long is your lease(s)?

Q22 How much notice will you receive in advance of being asked to vacate the land?

Q23 What barriers (if any) have you experienced when trying to gain access to land?

Q24 Has your UFE experienced any difficulty in securing routes to market for its produce?

Q25 In the box below, please elaborate on the barriers to market that your UFE has experienced.

Q26 Has your UFE experienced any technical barriers that require specialist knowledge and expertise?

Q27 Please describe these technical barriers in the box below.

Q28 Please describe any factors which you believe have been key to the development of your UFE.

Q29 Is your UFE part of a producer co-op?

Q30 Please indicate in the boxes below what percentage of your UFE's produce stays within the borough within which your UFE is located, what percentage goes to the wider city within which your UFE is located and what percentage goes outside the city. The total must add up to 100.

Q31 Please name the business' that you supply within the city that your UFE is located.

Q32 How is this produce transported around the city? You may select multiple options if appropriate.

Q33 What systems do you have in place to manage waste created during your production processes?

Q34 Please indicate what food product(s) your UFE specialises in processing. You may select multiple options if appropriate.

Q35 Please indicate in the boxes below what percentage of the produce your UFE handles is sourced from producers based within the borough that your UFE is located, what percentage is sourced from producers based within the wider city in which your UFE is located, what percentage is sourced from producers based outside the city in which your UFE is located, and what percentage (if any) is your own produce. The total must add up to 100.

Q36 Please name your suppliers.

Q37 Please now indicate in the boxes below what percentage of your produce (post processing) is sold to wholesalers/retailers operating within the borough your UFE is located, what percentage is sold to wholesalers/retailers operating within the wider city that your UFE is located, and what percentage goes outside of the city. The total must add up to 100.

Q38 Please name the business(es) that you supply within the city including the borough within which your UFE is located.

Q39 How is this produce transported into/around the city?

Q40 Please describe the type, scale and location of your food processing operations?

Q41 Have you experienced any difficulties in meeting food standards/regulations?

Q42 What systems do you have in place to manage any waste created during your production processes?

Q43 Please indicate which of the following best reflect the retail model of your UFE. You may select more than one definition if appropriate.

Q44 What do you estimate to be the size of your consumer base?

Q45 Please indicate in the boxes below what percentage of your produce is sourced from producers/food processors based within the borough in which your UFE is located, what percentage of your produce is sourced from producers/food processors based within the wider city in which your UFE is located, and what percentage is sourced from producers/food processors based outside the city. The total must add up to 100.

Q46 Please name these suppliers.

Q47 How is produce transported to your UFE? Please select multiple if appropriate.

Q48 Do you offer a home delivery service?

Q49 What mode of transport is used for deliveries?

Q50 Regarding the cosmetic standards of food, please indicate the position of your UFE in relation to EU 'marketing standards' by selecting one of the options below.

Q51 Why do you enforce these higher standards?

Q52 What systems do you have in place to manage any waste created by your processes?

Q53 Does your UFE currently stock out of season foods?

Q54 Where do you source your out of season produce from?

Q55 Do you believe that your UFE is disadvantaged by not being able to offer the same levels of convenience to consumers as offered by supermarkets?

Q56 Has your UFE taken any steps to try and mitigate this disadvantage?

Q57 Please explain what steps your UFE has taken to try and mitigate this disadvantage?

Q58 Please indicate which of the following best reflect the model of your UFE. You may select more than one definition if appropriate.

Q59 What do you estimate to be the size of your consumer base?

Q60 Please indicate in the boxes below what percentage of your produce is sourced from producers/food processors based within the borough in which your UFE is located, what percentage of your produce is sourced from producers/food processors based within the wider city in which your UFE is located, and what percentage is sourced from producers/food processors based outside the city. The total must add up to 100.

Q61 Please name these suppliers.

Q62 How is produce transported to your UFE? Please select multiple if appropriate.

Q63 Do you offer a home delivery service?

Q64 What mode of transport is used for deliveries?

Q65 Do you require that your produce meet certain aesthetic cosmetic standards?

Q66 Why do you enforce these standards?

Q67 Does your UFE currently cater for organisations/institutions?

Q68 Using the boxes below please indicate what percentage of these organisations/institutions are public sector, private sector and third sector institutions. The total must add up to 100.

Q69 What systems do you have in place to manage any waste created by your processes?

Q70 Does your UFE currently stock out of season foods?

Q71 Where do you source your out of season produce from?

Q72 Please indicate how many paid staff are employed by your UFE.

Q73 Please indicate how many people work for your UFE in an unpaid voluntary capacity.

Q74 Of your staff and volunteers, how many are trained professionals in the field in which your UFE specialises?

Q75 Which of the following best reflects your UFE's relations with its local authority?

Q76 Please offer any examples of where public policy has served to inhibit the viability of your UFE.

Q77 Please offer any examples of where public policy has served to aid the viability of your UFE.

Q78 What is the overriding purpose or goal that your UFE seeks to achieve?

Q79 Does your UFE seek to network with other enterprises it deems 'like-minded'?

Q80 What are your UFE's perceptions of other groups in your network?

Q81 Does your UFE enjoy links with any other types of organisations or groups? If yes please list them.

Q82 Please describe any ways in which your UFE seeks to influence its consumer base.

Q83 Please indicate which of the following best reflect the motivation(s) behind your UFE.

Q84 Do you consider your UFE to be part of a wider local food 'movement'?

Q85 Below are nine stages within the food cycle. Please move the following options into rank order of contribution you think they make to greenhouse gas emissions from 1 (most) to 9 (least). Simply select and drag into your preferred order

Q86 Please indicate below what resources your UFE shares with other parties in the city?

Q87 Please further elaborate regarding your UFE's (re)use and/or sharing of resources

Q88 Please give the full postcode for where your UFE is located. This will only be used to map the local food system in the city in which your UFE is located

Q89 What is the name of the local authority that your UFE is legally registered with?

A8.2 Community Food Enterprise Consumer Survey

July, 2014

Dear Sir/Madam,

‘Cities on the Grow’ survey of local food and consumer behaviour

We are currently conducting a study on consumer practices and attitudes toward local food. For this study, we are asking consumers of ‘Urban Food enterprises’ (UFEs) to give us their views on ‘local food’ by completing an online survey. For the purposes of this survey we are asking participants to note the following:

- References to ‘city’ in the survey refer to the case study cities of Amsterdam, Almere and London, and the town of Reading inclusive of all districts or boroughs within the case study cities; and
- Many attempts have been made to define what constitutes a local food system and this remains a contested space. We ask that prospective participants only complete the survey if the UFE they are a consumer with is located in, or within a 30-mile radius of the edge of their respective case study city.

Participation in the study is voluntary. Though if you could spare some time to complete this questionnaire, it would be greatly appreciated. It should take no more than 15 minutes of your time to complete. The research is part of a wider project entitled ‘Cities on the Grow’. This is a collaborative research project between the University of Reading, Wageningen University and the Deltares Research Institute. All results of this project, which is funded by the European Institute of Innovation and Technology as part of the Climate Knowledge and Innovation Community (Climate KIC), will be publicly available on our website in the Spring of 2015.

We can reassure you that all your answers and responses to this questionnaire will remain anonymous and confidential as no question asks for your identity or full address. By completing the questionnaire you are acknowledging that you understand the terms of participation and that you consent to these terms. This project has been subjected to ethical review, according to the procedures specified by the University of Reading Research Ethics Committee, and has been allowed to proceed.

From all of us on the project team at ‘Cities on the Grow’:

Thank you very much for your help in carrying out this research. If you have any queries, please do not hesitate to contact us at project.team@citiesonthegrow.org

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 3. I understand that my participation is entirely voluntary and that I have the right to withdraw from the project at any time, and that this will be without detriment.
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If you do not agree to these terms and conditions please do not go on to complete the rest of the survey

Q1 Please answer the following by ticking the relevant boxes in the table below. If you are not familiar with specific terms, please answer 'no'.

Q2 Please indicate below the cost of your average monthly food bill in pounds?

Q3 Please indicate where you purchase the various products listed on the left-hand side of the table below by ticking the appropriate boxes. You may select multiple options for one product. If you do not purchase certain products listed, please leave them blank.

Q4 Having thought about where you purchase certain products, please estimate what percentage of your shopping is done with which type of retailer and write this as a percentage in the relevant box(es) on the right hand side of the table below.

Q5 Below are nine stages within the food cycle. Please rank these in order of contribution you think they make to greenhouse gas emissions from 1 (most) to 9 (least).

Q6 Please illustrate what considerations are most important to you when purchasing food by providing a rating for each of the options in the table below with ten signifying importance and zero not important.

Q7 Please indicate in the table below how you would define 'local food' by ticking next to the definition(s) you agree with. Please feel free to select multiple options and/or offer your own interpretation in the 'other' box.

Q8 Of the products that you currently purchase, please list those that you believe fit the definition(s) of local food you selected above and the name(s) of the company/enterprise(s) you purchase them from.

Q9 Are there products that you would like to be able to source in this manner but are currently unable to?

Q10 Do you make a conscious effort to purchase local food?

Q11 Please let us know what motivates you to buy local food by ticking the box next to the appropriate statement(s) below.

Q12 Do you have any further comments regarding your motivations for buying local food?

Q13 When you purchase local food, do you do so with the feeling that you are choosing a sustainable option?

Q14 Would you agree that the sustainability of any product (produced locally or not) is determined by the practices endorsed during its production, processing and transportation?

Q15 Do you feel you have sufficient access to the necessary information about these practices to be sure that when you are purchasing local food it is indeed therefore a sustainable option?

- Q16 What (if any) do you perceive to be the barriers to you purchasing local food?
- Q17 What affect (if any) has shopping with a UFE, had upon you?
- Q18 Would you like to see local food increasingly integrated into public policy?
- Q19 Do you purchase out of season produce?
- Q20 Do you purchase this with a UFE?
- Q21 If the UFE did not stock this out of season produce, would you shop elsewhere or adapt your eating habits in accordance with what produce was available from the UFE?
- Q22 Do you expect the food you purchase to meet certain cosmetic standards?
- Q23 Do you think that your decision to shop with a UFE has increased the cost of your average food bill?
- Q24 Please indicate your age by ticking the appropriate box below?
- Q25 Please indicate your gender age by ticking the appropriate box below.
- Q26 Please provide us with your full postcode in the box below.
- Q27 Please specify your ethnicity by ticking in the appropriate box below.
- Q28 Please indicate the highest level of education you have attained by ticking the appropriate box below?
- Q29 Please indicate you occupational status by ticking the appropriate box below.
- Q30 Please indicate your household composition by ticking the appropriate box below. You may tick multiple options if that best reflects your situation. Please only tick an option that encompasses children if they are classed as dependents.
- Q31 Please indicate if you are a recipient of food aid and if so in what form, by ticking the appropriate box(es) below. You may tick more than one if that best reflects your situation.
- Q32 Please indicate by ticking the appropriate box below what your annual household income is?

A8.3 UK combined workshop: detailed programme and participants

Programme

11:00–11:20: Welcome

11:20–12:10: What does it mean to be alternative?

Split into groups

- What is the nature of your organisation's alterity?
- What motivates this?
- How does your organisation put its alterity into practice?

12:10–13:15: How do you envision this alternative being played out?

Stay in groups

- How do you envision this alternative food future?
- What place is there for monitoring and evaluation in ensuring the facets of this alternative are maintained?
- What contribution would this alternative make to social-environmental justice?

13:15–14:00: Lunch

14:00–14:30: Barriers and support

Whole group

- What are the barriers to the creation/maintenance of your organisation's alternative food practices?
- What support already exists to help overcome these barriers?

14:30–15:45: What support is needed but missing?

Whole group

- By conducting a mapping exercise using existing barriers and support, locate fallout points where either new forms of support, or stronger/new linkages between existing support could be beneficial

15:45–16:00: Summary of the day's findings

A8.4 NL workshop I: detailed programme and participants

Programme

The workshop took place on 9 October 2014 at Stadsboerderij (urban farm) in Almere.

Part I Sense making and introduction: working on common ground

- 13:30 *Welcome and introduction to the programme and each other*, Gerda Lenselink
- 13:50 *Urban Farming landscape in Almere*, Arjan Dekking
- Presentation, followed by discussion, with special focus on the situation in Amsterdam
- 14:00 *How urban farming can contribute to climate adaptation and mitigation*, by
- Presentation based on literature search, Suzanne van der Meulen
- 14:10 *Results from interviews and questionnaires with UFEs and consumer groups in London, Reading and Almere/Amsterdam*
- Presentation, Gerben Mol

Part II Imaging and visioning and lessons on successes and constraints

- 14:15 World café or carousel: working in three subgroups on different questions, three discussion leaders stay at their table; groups circulate:
- Table 1. *Dreaming about the direction/vision on urban farming*. What will it look like? What potential does it have?
 - Table 2. *Which conditions contribute to the success or failure of urban farming?* What are the barriers?
 - Table 3. *What is the role of incubator?* What should an incubator achieve?
- There will be three rounds. Groups change tables after 25, 20 and 20 minutes respectively, and build further upon gathered results. The discussion leader explains the results so far. Proposed discussion leaders: Gerben, Suzanne and Gerda (Arjan will have a free role).
- 15:15 Tea break

Part III Towards two or three business incubators

15:30 *Looking at yield and determination of business incubators*, Gerda Lenselink and Arjan Dekking

- Plenary; everybody will be asked to name what will accelerate urban farming in Almere within the context of AgriFoodBin and/or name a potential business incubator. Result will be a long list.
- Ranking/selection of potential business models by criteria (contribution of potential models to urban farming, climate adaptation and job creation). We can ask the group to sticker and rank; followed by discussion.

16:30 *Wrapping up*, Gerda Lenselink and Arjan Dekking

- Plenary conclusion, expectations/appointments towards second workshop
- Followed by juices/wine and networking

A8.5 NL Workshop II: detailed programme and participants

Programme

Part I Introduction and remaking sense: working on common ground

13:30 *Welcome and Introduction to the programme and each other*, Gerben Mol

Remaking sense of Workshop I, Gerben Mol

- Short presentation and how we will elaborate on these results in this workshop
- *Imagining the future Almere marketplace*, Gerda Lenselink

Part II Pains and gains: finding value propositions for a business incubator for urban agriculture

13:00 *Explanation of pains and gains approach to making a value proposition*,
Tijmen Altena

- Short presentation from his business incubation perspective
- Introduction to the work in two subgroups

14:15 Pains and gains round: working in two subgroups, one on meso-scale
the other on micro-scale. Questions to be validated:

1. Is this really a pain for your business?
2. What does it cost to solve this problem, or what does it save when the problem does not exist?
3. If an incubator could provide a service that would solve this problem, what would you be willing to pay, and in what way (hourly rate, success fee, etc.)
4. Have you missed pains that we should address?

Part III About financial mechanisms and business models for urban agriculture and the future of this project

15:30 *Possibilities for financing urban agriculture*, Gerda Lenselink

16:30 Wrapping up and the future of this project/process, Gerben Mol

– Followed by drinks and networking

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