FOOD FUTURES
PANEL

OPM GROUP

Urban Agriculture Project

A GFS Food Futures panel activity

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Author(s)	Tim Vanson, Ilina Georgieva,
Quality Assurance by	Diane Beddoes
Main point of contact	Diane Beddoes
Telephone	0207 042 8000
Email	info@dialoguebydesign.co.uk

If you would like a large text version of this document, please contact us.

OPM Group

252B Gray's Inn Road
London
WC1X 8XG

+44 (0)20 7042 8000
www.dialoguebydesign.co.uk
info@dialoguebydesign.co.uk

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1.1. About this project

The Global Food Security (GFS) programme brings together the UK's major public funders of research into food security. A central part of the programme is to understand and respond to public views on global food security challenges and potential solutions. To help meet this aim, the GFS programme has commissioned a panel of 600 members of the public to take part in engagement activities, including deliberative and online activities exploring different aspects of research on food security research. The GFS programme will be using the findings to inform the direction of publicly funded food research in the UK. The panel is co-funded by Sciencewise[1].

The Urban Agriculture project was one of the two large-scale mixed methods activities undertaken early on with the Food Futures panel, alongside the Food Systems project. The aim of the Urban Agriculture project was to **explore with the public some of the issues associated with food production and supply for a growing urban population, and new technologies and approaches that might be required.**

This aim was broken down into five objectives:

- To introduce urban agriculture, including why it is needed, approaches, technologies and examples.
- To explore participants' views on urban agriculture, including the underlying values driving these views.
- To explore differences in views on urban agriculture.
- To understand the trade-offs participants make on determining the acceptability or unacceptability of urban agriculture.
- To identify "red lines" beyond which urban agriculture is not acceptable, and the factors that determine the positioning of these lines.

The project comprised both online and offline elements. The online elements included blog posts, forum discussion and individual digital diaries, in which panel members were encouraged to record their reflections on the role of urban agriculture. The offline activities comprised two half-day and two full day workshops, held in November and December 2015 in London and Belfast. We used specialist input at several points, primarily during development of stimulus materials and at the workshops.

[1] Sciencewise is the UK's national centre for public dialogue in policy making involving science and emerging technology issues

During the half-day workshops, participants were presented with three case studies, each outlining a specific agricultural approach – aquaponics[2], community garden (crops only) and commercial urban farm (crops and livestock). During the full-day workshops, two more approaches were added (commercial garden and community farm) as part of a city building game where participants were asked to decide which of the available approaches they would use in their city, for what poduce and where they would locate it.

1.2. Main findings

Framing urban agriculture: At the start of the project, many participants, both online and offline, questioned whether urban agriculture is relevant to the UK. This seems to have been driven in part by participants' belief that the UK has a substantial amount of agricultural land and in part by their view that instead of producing more we should learn how to waste less and distribute what we have better.

Participants identified different roles for urban agriculture in the UK, with these being informed by different views of its aim. Some people focused on productivity, and questioned whether urban agriculture could be of sufficient scale to be cost effective. Others emphasised the educational potential, seeing urban agriculture as a means of widening knowledge about food origin and production and hence perhaps valuing it more highly.

Approaches: Participants looked at five approaches to urban agriculture: aquaponics, commercial garden (crops only)*, community garden (crops only), commercial urban farm (livestock and crops), community urban farm (livestock and crops)*[3].

Aquaponics was received very positively, being seen as efficient, self-sufficient and clean. The primary advantages identified were low water requirements, minimal use of pesticides, the closed nature of the system, whereby nutrients are recycled and the possibility of siting projects in abandoned buildings and underground spaces.

Participants felt that the availability of land and competition for land could impact on the viability of commercial and community garden approaches. While the social benefits of community gardens were seen as sufficient to gain them a place in the urban system regardless of land scarcity, commercial gardens were seen as viable only if productivity were sufficiently high.

Animal welfare and the impact of livestock on urban residents' quality of life were the main issues in discussions of commercial and community farms. Community farms were seen as having educational benefits, but the time and labour involved in caring for animals was seen as a potential disadvantage. Animal welfare was often seen as a 'red line', marking acceptable from unacceptable approaches, with the countryside being seen as the 'proper' place to raise animals, and the urban

[2] A system of aquaculture where crops' roots are submerged into water and receive their nutrients from the waste produced by farmed fish.

[3] Approaches marked with * were only discussed in the workshop activities

context as impractical and cruel. The smell and noise of slaughterhouses on urban sites was another area of concern. During the workshop activities, some participants became increasingly more open to the idea of raising animals in cities, providing that the conditions would be suitable.

Impacts, benefits and opportunities: The potential for urban agriculture to educate and inform people about how their food is produced was seen as an important benefit across all strands of the project. Bringing food production closer to where people live and helping them to engage with different agricultural approaches could, participants thought, encourage them to make positive changes to their diets, such as eating more fruit, vegetables, fungi and seasonable produce. Their appreciation of food would grow and their willingness to waste it would decrease. In both online and face-to-face activities, participants emphasised the importance of educating people about food production and healthy eating, from an early age.

Ownership and workforce: The benefits and disadvantages associated with public, or community ownership, social enterprises and private, profit-driven models were discussed primarily in the London workshops, and the discussion largely played out familiar debates about the relative merits and disadvantages of different models of ownership, but in the specific context of urban agriculture. Some participants argued that if urban agriculture used public resources such as land, then they would expect the projects to be owned and run by the community while others thought that private enterprises would be better managed and have higher productivity.

Differences in participants' views of the different ownership models can be traced back to their different interpretations of the role of urban agriculture. Those who discussed it in the context of cities becoming more self-sufficient expressed a preference for commercial ventures while those who believed that urban agriculture should have a predominantly social focus opted for a social enterprise model. Most saw urban agriculture as having multiple roles to play, so during the city building game, most participants chose a mixture of community and commercial approaches and tried to strike a balance between the two.

Land use and locations: Participants tended to locate urban agriculture approaches in currently unused spaces such as rooftops, vacant warehouses and underground spaces, perhaps reflecting their concerns about land scarcity and housing shortages. Location was often a determinant of views on the particular locations most suitable for urban agriculture.

Other factors that informed participants' choices were the ownership model, the type of produce farmed and the features particular to a given location, such as proximity to rural areas or transience of population. Approaches with strong community benefits were welcomed in public places, but commercial approaches were seen as less acceptable in these contexts.

Crops and fungi were welcomed in central and residential locations because they could have a pleasing or neutral impact on the environment and on residents' quality of life. Livestock were less acceptable in these locations because of the potential for bad smells, noise and the impacts of animal slaughter.

Produce: Participants tended to favour high-yield produce with short growing times that could be sold at a premium. The only exception to this was produce in community gardens where emphasis was on seasonal and native crops.

Views on produce differed depending on the type of approach discussed. In low tech approaches such as community gardens and farms, participants tended to favour low maintenance produce while high and medium tech approaches were usually associated with high value produce that could offset running and set-up costs.

Funding and viability: Funding for urban agriculture was a central issue that participants thought needs to be resolved if food production is to shift towards urban areas. The predominant view was that urban agriculture would only thrive if supported by an external funding stream. Participants discussed whether urban agriculture could be profitable, and indeed, whether it should be. Some argued that the wider benefits of urban agriculture warranted public funding.

Trade-offs and red lines: Participants made a number of trade-offs throughout the project, some generated through the discussion and some responding to those presented to them through the project materials.

- Participants were consistently unwilling to compromise on animal welfare, which was a primary concern in discussions of farming livestock in urban settings.
- High value produce was often selected for commercial garden projects. In these instances participants tended to trade off the economic viability and sustainability of a commercial project over against its capacity to provide affordable and accessible produce
- Participants were willing to sacrifice high productivity in order to realise the social and educational benefits that they identified in approaches such as community gardens, which they felt have high social and educational benefits.
- Participants often chose to locate community farms away from residential areas even though this would impact on their accessibility.
- In one group participants were willing to locate their community garden on a rooftop. This involved an explicit compromise on its accessibility to the community based on the realisations that land in the city is in short supply and is expensive to purchase.
- Participants were very positive about the health and efficiency benefits of crops grown using high technology approaches such as aquaponics. The benefits attributed to this approach were not reduced by any perception that such approaches are not ‘natural’, by virtue of not being soil-based.

Chapter 2: About the project

2.1. Background to the activity

The Global Food Security (GFS) programme brings together the UK's major public funders of research into food security. A central part of the programme is to understand and respond to public views on global food security challenges and potential solutions. To help meet this aim, the GFS programme has commissioned a panel of 600 members of the public to take part in deliberative dialogue activities exploring different aspects of research on food security research. The GFS programme will be using the findings to inform the direction of publicly funded food research in the UK. The panel is co-funded by Sciencewise. [4]

The Urban Agriculture project was one of the two large-scale mixed methods activities undertaken early on with the panel, alongside the Food Systems project.The aim of the Urban Agriculture project was to **explore with the public some of the issues associated with food production and supply for a growing urban population, and new technologies and approaches that might be required.**

The aim was expanded into five specific objectives:

To introduce urban agriculture, including need case, approaches, technologies and example.

This objective aimed to ensure that all participants had sufficient information at the start of the activity to enable them to engage with the topic.

To explore participants' views on urban agriculture, including the underlying values driving these views.

We sought to understand the basis of participants' views and how these changed over the course of the activity.

To explore differences in views on urban agriculture.

We sought to identify differences and common themes in participants' views and to explore the drivers behind them.

[4] Sciencewise is funded by the Department for Business, Innovation & Skills (BIS). Sciencewise aims to improve policy making involving science and emerging technology across Government by increasing the effectiveness with which public dialogue is used, and encouraging its wider use where appropriate. It provides a wide range of information, advice, guidance and support services aimed at policy makers and all the different stakeholders involved in science and technology policy making, including the public. Sciencewise also provides co-funding to Government departments and agencies to develop and commission public dialogue activities. www.sciencewise-erc.org.uk

To understand the trade-offs participants make on determining the acceptability or unacceptability of urban agriculture.

We sought to understand what factors were most important to participants and how they prioritised the different potential benefits and disadvantages of urban agriculture approaches.

To identify "red lines" beyond which urban agriculture is not acceptable, and the factors that determine the positioning of these lines.

We wanted to know whether participants would find any agricultural activities unacceptable in an urban setting, and why.

Each of the project activities was designed to focus on one or more of the objectives. In the table below we have indicated how the project activities map against these objectives. The 'X's in each box show which activities addressed which objectives, and the degree of focus on these objectives. Boxes with 3 'X's show activities designed specifically to address particular objectives. Boxes with 2 'X's show where facilitators were briefed to explore or prompt on issues raised by participants that refer to particular objectives. Boxes with 1 'X' show where issues raised by participants that refer to particular objectives were noted but not explored.

URBAN AGRICULTURE: OVERVIEW OF PHASED PROCESS			Objectives	To introduce urban agriculture, including need case, approaches, technologies and examples	To explore panel participants views on urban agriculture, including the underlying values driving these views	To explore differences in views on urban agriculture	To understand the trade-offs participants make in determining the acceptability or unacceptability of urban agriculture	To identify "red lines" beyond which urban agriculture is not acceptable, and the factors that determine the positioning of these lines
Activities								
Introductory week	Preliminary information	Blog post and advert to introduce activity. Include information about need case and technologies. Encourage comments on blog post		XXX	X	X		
		High level overview (animation). Signposts to information resources. Information on UA in/close to each		XXX				
Online discussion	Forum discussion 1	Expand on introductory information. Explore initial views. Awareness of UA projects in their vicinity.		XXX	X	X		
	Forum discussion 2	What problems might UA help us to address? What might we need to think about if we were to introduce agriculture into urban settings? Why?			XXX			X
	Forum discussion 3	What types of food might we grow in urban settings? Why?			XXX	XX	X	X
	Question bank	Two rounds of expert responses to questions posted online.		XXX				
Halfday workshop	Review	Overview of preliminary activities and outputs						
	Educative	Information provision (experts)		XXX				
	Exploratory	Case studies: carousel round 4 workstations (expert support)			XX			
	Reflective	Participants reflect on information received: highlight main themes. Set-up digital diaries.			XX	XX	XX	X
Interim activities	Blogging	4 blogs describing each case study						
	Digital diaries	All panellists: Workshop participants' reflections on workshop information/discussions; other panellists respond to general questions			XX	X		
		Any themes explored further/discussed with family or friends?			XX	X		
		What foods in your shopping basket could be produced in an urban environment, and why? What foods couldn't be produced in an urban environment, and why not?			XX	XX		X
Full day workshop	Review	Overview of activities/outputs to date: feedback on main themes arising. High level refresh of information.						
	Deliberative	Scenario-based activity to explore detailed views on UA: stimulus tools/materials to focus discussion on research topics			XX	XX	XXX	XXX
	Reflective	Review and reflect on deliberative activity: plot attitudes and redlines					XXX	XXX
Wrap up activity	Reflective	Blog summarising discussions at workshop, including expert reflections on experience of being involved and value of UA input from panel as a whole.						

2.1.1. Sciencewise Guiding Principles

The delivery of this project was guided by the Sciencewise quality framework and designed to align with Sciencewise Guiding Principles. Both principles and quality framework aim to ensure that public dialogue is fair, effective and credible. You can read about learning from the project in the independent evaluator's report which can be found on the Sciencewise webpage for the Global Food Security panel, here.

Steering Group Members
Tim Benton, GFS
Riaz Bhunno, GFS
Caroline Drummond, LEAF
Lucy Foster, Defra
Tara Garnett, University of Oxford
Peter Jackson, University of Sheffield
Roland Jackson, Independent
Huw Jones, Rothamsted Research
Hannah King, NERC
Suzannah Lansdell, Sciencewise
Jennie Macdiarmid, University of Aberdeen
Alison Mohr, University of Nottingham
Kieron Stanley, Defra
Geoff Tansey, Food Systems Academy
Jon Woolven, IGD

2.2. Involving specialists

Dialogue, particularly that promoted by Sciencewise, is a two-way process of deliberation between the public and 'specialists' on a topic.[5] This means that expertise is brought to the room to help participants engage with the landscape and content, but also so that specialists can hear from the public. This project involved a number of specialists from within the GFS programme, and others recruited specifically for their expertise in the topic area.

The aims and research questions of the urban agriculture topic were proposed by the GFS team, and developed iteratively with the topic leads from the steering group which oversees the public panel project (see left for membership). We also drew on specialist input when developing stimulus materials and as participants in the workshops. We aimed to include a broad range of specialists and stakeholders in the development of the activity including academics, third sector representatives and industry. Table 1 provides a list of specialists involved and the role they played.

Table 1. Specialist involvement in urban agriculture project

Specialist	Involvement
Andre Viljoen, Research Initiatives Leader, Architecture and Interior Architecture, School of Art Design and Media, University of Brighton	Scoping interview
Greg Keefe, Professor of Sustainable Architecture, Queens University Belfast	Online question and answer sessions
Dr Chiara Tornaghi, Research Fellow in Urban Food Sovereignty and Resilience, Coventry University	Online question and answer sessions
Dr Jim Monaghan, Principal Lecturer - Fresh Produce Research Centre, Harper Adams University	Online question and answer sessions
Geoff Thomson, Ulster Farmers Union, Animal Health and Welfare Policy Committee and Pork and Bacon Policy Committee Poultry Policy Committee	Attended Belfast half-day workshop
Hayley Smith, University of Nottingham, 3rd Year PhD Plant Science	Attended Belfast half-day workshop

[5] See later section in this chapter for definition of terms, including 'specialist', used in this report.

Specialist	Involvement
Dr Laura Vickers, Crop Production and Agronomy Lecturer, NERC KE Fellow in Horticulture, Harper Adams University	Online question and answer sessions, attended Belfast half day workshop, Belfast full day workshop, London full day workshop
Andy Jenkins, Ph.D. Candidate, Building Integrated Technical Food Systems, Queen's University Belfast	Attended Belfast full-day workshop
Dr Marina Chang, Research Fellow, Centre for Agroecology, Water and Resilience, Coventry University	Attended London half-day workshop
Kate Parkes, Senior Scientific Officer, Farm Animals Department, Science Group, RSPCA	Attended London half-day workshop
Dr Chungui Lu, Head of Centre for Urban Agriculture, University of Nottingham	Attended London half-day workshop
Dr Robert Biel, Development Planning Unit, University College London	Attended London full-day workshop
Paul Smyth, Designer/Director/Cofounder at Something & Son and the FARM: shop	Dalston FARM case study interview, Attended London full day workshop
Ulf Hackauf, Environmental Technology & Design Department of Urbanism, TU Delft	City Pig Farm case study interview
Siobhan Craig, Founder of GROW NI	GROW NI case study interview

2.3. Our approach

2.3.1. About the Food Futures panel

The Food Futures panel is designed to facilitate both online and face-to-face engagement. The panel is managed through a software portal, which can host a range of different digital materials and activities. The panel is closed, with members recruited to a quota and all content is password protected, allowing privacy for participants. The panel is clustered in 6 locations around the UK, allowing for a diverse sample but also the opportunity for face to face activities.[6]

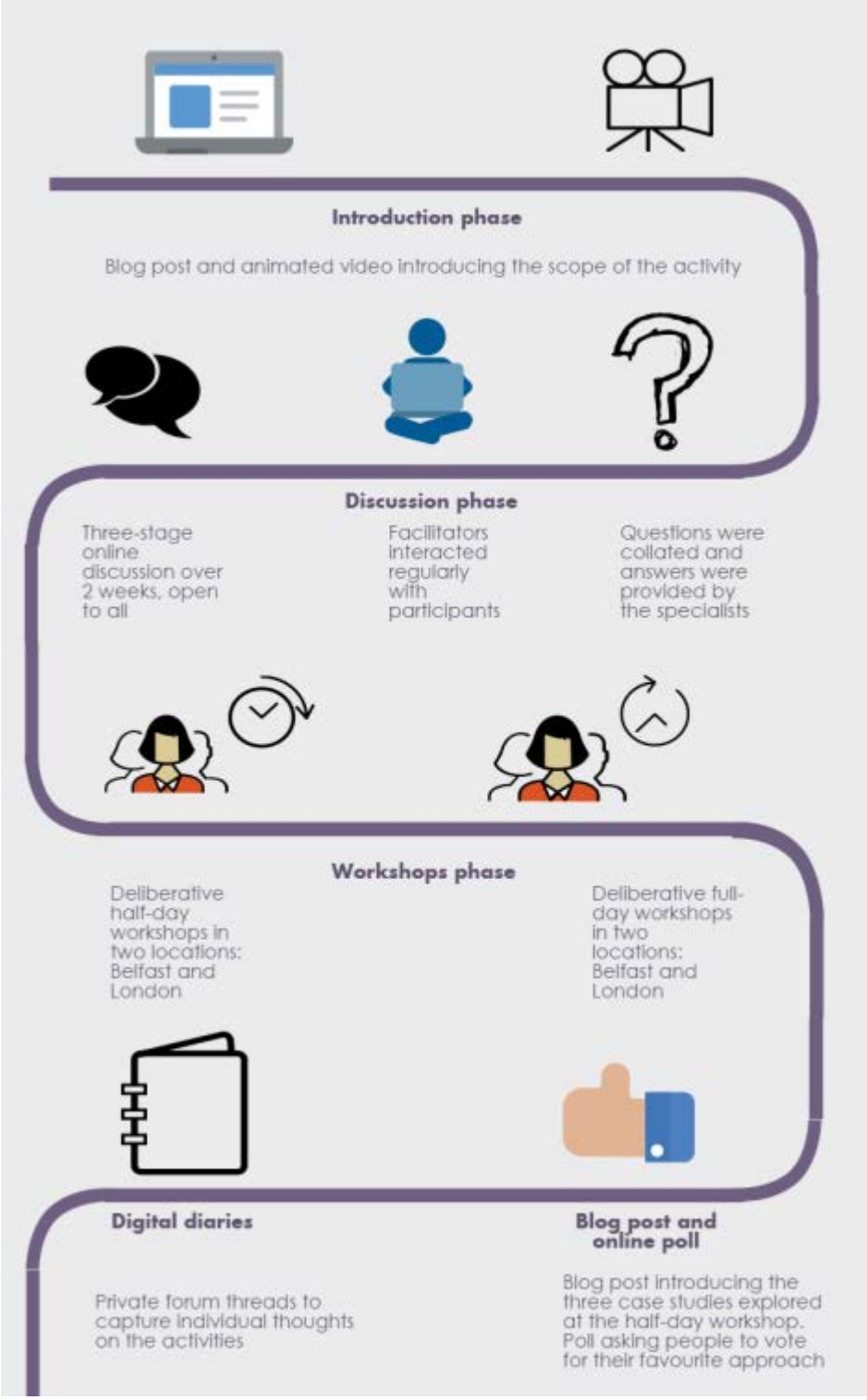
The panel consists of 600 participants, quota sampled to be broadly representative of the UK population. The sample does not perfectly represent the UK, ethnicity is representative of local areas, and there is a slight bias towards female participants, middle age groups and more educated participants. Participants are incentivised to take part in some of the panel activities, with the value of the incentive tailored to the specific method or topic. Not all activities are incentivised – for example, ongoing engagement that is not part of a project on a specific policy topic tends not to be incentivised.

[6] Locations are: Belfast, Cardiff, Dundee, Harrogate, London, Plymouth.

2.3.2. About the Urban Agriculture project

The Urban Agriculture project combined a mix of on- and offline activities, as shown in Figure 1 below.

Figure 1. Urban Agriculture project process



In the **introductory blog** and **video** we introduced urban agriculture, put it within the wider context of the food security debate and outlined some of the benefits and challenges it presents. These materials were posted online and available to all panellists, who were invited to comment on them. Comments made at this stage contribute to the data on which this report draws.

The introductory stage was followed by a **two-week forum discussion**, open to all panel members. This had three main stages, structured by questions designed to:

- Explore initial awareness and views of urban agriculture (Stage 1).
- Identify what benefits and challenges participants identify with different urban agriculture approaches (Stage 2).
- Explore participants' views on what types of produce would be acceptable to be farmed in urban settings (Stage 3).

To stimulate discussion, at the end of both stages 1 and 2, participants' questions were collated and answers provided by the specialists.

2.3.3. Face-to-face workshops

The online work was followed by two sets of reconvened workshops – one half-day and one full day - held in Belfast and London. Each workshop was attended by specialists who engaged with participants at their tables.

Half-day workshops

Participants had varied levels of online engagement with the topic prior to the first, half-day workshop and some had not joined in the online discussion at all. To provide information to those less familiar with the rationale for looking at urban agriculture and the challenges and benefits it raises, one of the specialists gave an introductory presentation which covered in brief:

- what global food security is;
- what urban agriculture is;
- what opportunities and challenges urban agriculture presents.

The primary focus of the half-day workshop was to introduce three different approaches to urban agriculture and most of the morning focused on the case studies through which they were introduced:

Case study	Technology type
GROW NI	Community garden based in Belfast (low tech)
FARM:	An urban farm using aquaponics bases in London

	(medium tech)
CITY PIG FARM	Research project about locating a pig farm in the Hague , Netherlands (high tech)

Each case study presented an approach to urban agriculture and was introduced with a short interview with a representative of the project and an infographic outlining the main opportunities and challenges of the approach. Each case study was assessed against five parameters: water use, energy use, productivity, quality and socio-economic benefits.

After the half-day workshops, we posted summarised versions of the three case studies on the Food Futures online panel and asked participants to vote for their favourite approach.

Following the first half-day workshops, we launched **the Digital diaries** activity. These were private forum threads visible only to the participating members. All panel members were invited to take part and answer 3 questions:

- What is the most interesting thing you have learnt so far about urban agriculture?
- Which of the topics explored during the urban agriculture activity did you discuss with friends and families? What were their reactions?
- Please record the foods you are buying over the course of the week and say if you would find it acceptable for them to be produced in an urban setting. If you would not, please explain why.

Full day workshops

The full day workshops, which ended the Urban Agriculture project, involved the people who participated in the half-day events meeting again, two weeks later, in the same location.

The workshops began with a short presentation providing further information about the need case for urban agriculture. This was followed by a short question and answer session with specialists, to explore in more detail some of the themes raised in the presentation.

Much of the rest of the workshop was focused on expanding upon and exploring in more detail some of the issues discussed in the half-day workshop, in relation to the three case studies. The main differences between the five approaches discussed in the full-day workshop were:

- the introduction of community farms, which allowed us to explore perceptions of rearing animals in urban environments, using “traditional” farming methods (i.e., not the high-tech City Pig Farm approach)
- the introduction of a distinction between commercial and community gardens and farms, which allowed us to explore whether ownership, perceptions of sustainability and productivity were affected by these variables.

The five approaches reviewed were summarised on a set of A5 cards and included:

- Community garden (crops, fungi)
- Community farm (livestock and crops)

- Commercial garden (crops, fungi)
- Commercial farm (livestock – e.g., City Pig Farm)
- Aquaponics, hydroponics (crops and livestock, herbs)

As participants reviewed the urban agriculture approach they were asked to identify the challenges and opportunities each might presents and the different types of produce it would be most appropriate to grow in each.

This initial discussion on approaches and produce provided the background against which to introduce the city building game. The game involved selecting four approaches to urban agriculture, deciding where, on a city map, each was best located and what produce should be grown there. Each small table had the following set of materials to use during the game:

- An A1 map of the fictional city.
- Information on different locations around the city where urban agriculture could be located (numbered to identify that location on the map).
- Information on the five different urban agriculture approaches with ratings against 5 parameters.[7]
- A set of produce cards with each card showing a type of produce.
- Coloured cubes, corresponding to each of the five urban agriculture approaches which could be placed on to the A1 map once a decision was made.
- A template to record their decisions and their rationale.

After lunch each of the groups was asked to nominate one or two participants to provide a 15 minute presentation to the rest of the room. The presentations provided an overview of the groups' overall vision for their city and their four purchasing decisions, explaining their rationale for choice of approach, location and produce.

Following each presentation, specialists and participants from the two other groups posed questions. The specialists assessed each presentation and attempted to identify a 'winner' – that group which had developed the most carefully considered proposals and met the brief of the game most effectively.

The closing session involved small group and plenary discussions on the Urban Agriculture project as a whole, focusing on participants' experiences of being a panel member, their views on what worked well and less well, both online and in the workshop and any suggestions they had for improvements to the process as a whole.

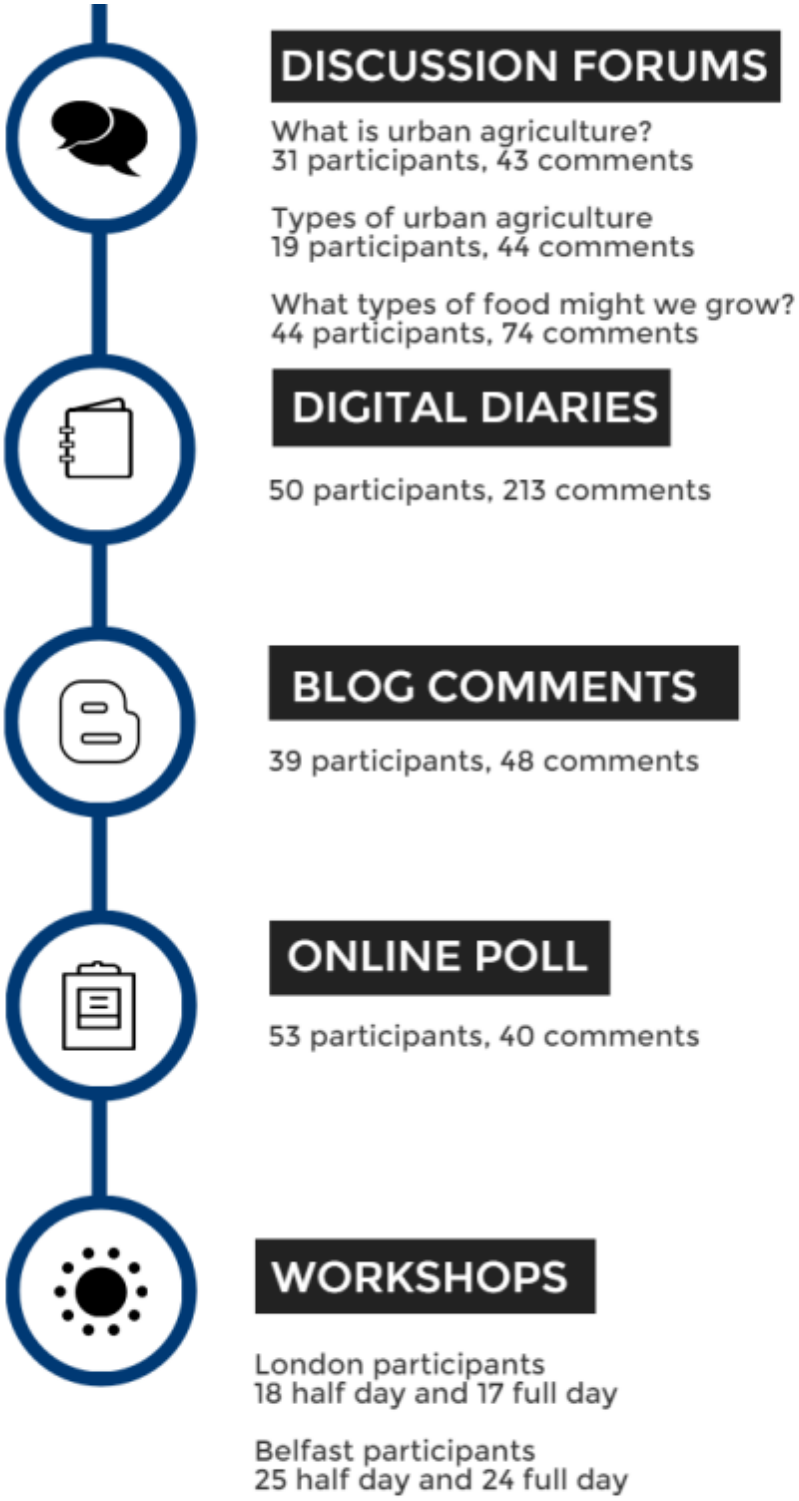
2.4. Sampling and recruitment

[7] The parameters were: energy use, water use, productivity, quality and socio-economic benefits which each had a high, medium or low rating. The ratings were based on comparisons with traditional agriculture.

For the Urban Agriculture project we used a range of open activities (open to all panel members) and invited activities (available to a selected group). The mix was designed to achieve wide engagement from across the panel, but also allow for us to work in more depth with a smaller number of participants.

	Sampling approach	**Reward strategy**
Introduction phase	None – open activity	None
Discussion phase	None – open activity	Three prize draws of £20 for participants in the forum discussion.
Workshop phase	Quota sampling across 2 selected locations – sampling for diversity rather than representativeness. The same participants attended both the half and full-day workshops. We recruited 26-28 people in each location, for an anticipated achieved sample of at least 25. Participants were recruited from the panel, using an agreed sample specification. As Belfast recruitment proved particularly challenging due to clashes with school entrance exams, two additional participants were recruited outside the panel to allow for expected dropout. The turnout in London was affected by the bad weather conditions on the day of the half-day workshop. The achieved samples were as follows: Workshop 1 (Belfast) 14th Nov: 25 attendees Workshop 2 (London) 21st Nov: 18 attendees Workshop 3 (Belfast) 28th Nov: 24 attendees Workshop 4 (London) 5th Dec: 17 attendees	Incentive of £30 for attending the half-day workshop and £70 for attending the full-day workshop.
Digital Diaries	None – open activity	One prize draw of £50.
Blog post and Online poll	None – open activity	None

2.5. Participation



The chart above provides a snapshot of how many participants engaged in the different strands of the project. The total number of unique participants across the various activities was 140. Further detail is provided in Appendix A.

2.6. Analysis and reporting

We used a thematic approach to analysis, producing an overarching coding framework, specifying themes and sub-themes. As analysis continued, we modified the framework to capture emerging themes. Transcripts were read in full and we used Nvivo[8] qualitative data analysis software to support the analysis. This enabled us to interrogate the data further by running queries to explore initial coding rounds in more detail. The final report is designed to meet the Sciencewise "Guidance for Final Dialogue Project Report".

2.6.1. Nature of data: online and offline

One of the purposes of the Food Futures panel is to test the innovative methodologies offered by an online panel whose members can also be invited to take part in face to face activities. We used a mix of methods for the Urban Agriculture project, which yielded different data types:

- **Blog and forum comments:** An asynchronous approach, with participants responding in their own time, to each other's comments and prompt questions from facilitators. This produced comments which are best analysed within their context. Comments varied in length but tended to express an argument or point, with some supporting evidence or rationale.
- **Digital diary:** Private forum threads where participants could reply to the three posted questions in their own time. This gave participants space to reflect on how their views of urban agriculture had evolved.
- **Workshops:** The workshop data was captured in digital recordings and facilitators' notes. This data is the most detailed and voluminous, with around 45 hours of recordings across the four events. Again comments are analysed in the context of the discussion to enable the analyst to understand this context. The possibility for the facilitator to interject with prompt questions means that comments are more often accompanied with an explanation of their rationale.

The workshop notes offer the richest data, followed by the forum, the digital diaries and the blog comments. The online data tends to introduce issues of initial importance to participants, rather than providing explanations of why these issues are important. This report is based on a cross-cutting analysis of all the data. Most of the findings draw on several sources and appear consistently across them. Where findings are based on a particular data source this is noted in the text.

One area where we identified potential differences in the nature of participant responses between the online and offline stages was attitudes towards farming animals in cities. While

[8] NVivo is a qualitative data analysis computer software package designed for use on qualitative unstructured data. http://www.qsrinternational.com/products_nvivo.aspx?

the majority of online comments about having livestock in cities remained negative, workshop participants became increasingly more open to the idea. This is further discussed in Chapter 8.

2.7. About this report

We start this report by looking at participants' views on the need for urban agriculture within the UK. This is important as the way participants defined urban agriculture influenced their opinion of what technologies urban agriculture should use, where it should be located or what type of produce it should provide.

This chapter is then followed by a brief summary of the main advantages and disadvantages of each approach as identified by participants. The key themes are then explored in further detail in the remaining chapters on:

- Chapter 5: Impacts, benefits and opportunities of urban agriculture
- Chapter 6: Ownership model and workforce of urban agriculture
- Chapter 7: Land use and location of urban agriculture
- Chapter 8: Produce of urban agriculture
- Chapter 9: Funding and viability of urban agriculture
- Chapter 10: Trade-offs and red lines

Within each chapter we discuss several (often overlapping) issues:

- What views participants expressed
- How they expressed them
- Whether those views changed in the course of the deliberation
- Why they changed, where it is possible to identify this.

2.8. Terminology

We use the following terminology in this report:

- "Topic" describes the main content focus of the project – in this case, urban agriculture. Topics are specifically policy directed.
- "Project" describes the implementation of a topic, using a method or methods. The Urban Agriculture project used mixed methods including blogs, online forum discussions, and face-to-face workshops.
- "Method" describes the approaches used to implement a project, for example, survey, blog, online forum discussion or workshop
- "Specialist" describes people with specific knowledge and/or expertise who have contributed to the project, without also holding a formal role (e.g., on the Food

Futures Steering Group, Project Management Team or as an employee of one of the GFS partner organisations).

Chapter 3: Framing urban agriculture: definition and need case

In this chapter we discuss the definition of urban agriculture we used, participants' views on the need for urban agriculture and what role they thought it could play in the UK. As participants' knowledge of urban agriculture increased, their views of how it could be incorporated in UK cities evolved.

3.1. Framing urban agriculture

In initial discussions during the development of this activity, we needed to agree on a broad framing of the topic: what did we mean by urban agriculture? We used the following definition:

Urban agriculture is the practice of growing plants, fungi, fish and livestock in and around towns and cities.

We also agreed with the project management team and policy leads on the topic that urban agriculture needed to involve some level of organisation or collective endeavour in both production and distribution. This excluded individual activities such as gardening and working on individually held allotments. However, it did allow the inclusion of community gardens worked by volunteers, with food distributed to them and their wider communities, as recompense for labour or for free, and commercially driven ventures.

3.2. The need for urban agriculture

It is estimated that by 2050, the majority[9] of the world population would be living in cities and yet our food production system is still predominantly centred on rural activities. Urban agriculture could help us achieve efficiencies by bringing food production closer to consumers and utilising the resources already available in cities. Some of the potential advantages of urban agriculture are:

- creating new uses for abandoned buildings, derelict sites or unoccupied rooftops.
- growing food closer to where we consume it could mean we eat it when it's fresh and reduce transportation times, which in turn could increase produce's shelf-life.
- providing education, training and employment opportunities for local people.

Early in the project, many participants argued that these benefits were not sufficient to justify the need for urban agriculture in the UK and some saw the idea as far-fetched and impractical.

[9] United Nation Population Fund: http://www.unfpa.org/urbanization

Participants pointed to the availability of agricultural land in the UK and the choice and quantity of food available in supermarkets. Some argued that instead of developing urban agriculture, more should be done by the government to support struggling rural farmers. The importance of making the need case clear was particularly evident in the workshops. We provided some information on the need case in the first workshop, but decided to elaborate on this at the start of the second workshop, to help ensure that the focus was on approaches to urban agriculture, rather than the wider questions about its need.

Discussions on how best to respond to the points raised in the need case for urban agriculture revolved around issues of production, distribution and waste. Whilst participants acknowledged that a growing population and depleting environmental resources present a significant challenge to food security, some felt that this challenge could be addressed by improving the equity of food distribution and reducing food waste. This latter issue recurred throughout the activity – prompted in part, at least, by a television programme highlighting the quantity of food waste in the UK, which was referred to by several participants and formed the focus of several online posts.

As we have all commented previously, distribution is the problem not growing the food!! We waste such a large percentage at present our efforts should be in the production of cheap / user friendly fuel. (…)Why grow more when we don't use what we produce now???

Blog comment

Whilst some participants did not recognise the need for urban agriculture in the UK as a whole, on the grounds of current sufficiency, others suggested that rural land was close, and that within the UK, some locations are better suited to it than others.

Belfast is not a big city, don't have to travel too far to be out in the country, so why would you have something like this in the city.

Belfast, half-day workshop

3.3. Meeting the need case

The broader discussion on the need case provided a foundation for more detailed exploration of specific technologies, produce and locations. These focused discussions provide some further indication of what kind of response participants felt urban agriculture might be to the challenges of global food security. To some extent, their views were technology dependent. For example, medium technology approaches such as hydroponics and aquaponics that produce high yields in small spaces brought a different range of potential benefits than low technology approaches such as community farms. In the workshops, it was also clear that factors particular to participants' background and experience had some influence over their views. For example, some of the London participants felt that high tech, commercially driven ventures were more appropriate to London, citing a transient population and people with little

time to dedicate to voluntary pursuits such as community gardens in arguing for this view. Others – also in London – focused on social enterprises, driven by the community and for the community. In Belfast, one view was that community gardens are a "middle-class trend", taken up by those with sufficient time and interest but of no real consequence in the larger scheme of things. However, this view was limited and the case study of Grow NI provided a strong counter to this argument.

Discussion of the ways in which urban agriculture meets the stated need case, and its value as a tool in a suite of approaches to addressing the challenges of global food security was recurrent throughout the activity, though often without the explicit link being made between these discussions and the need case. Some participants argued that urban agriculture could never be of sufficient scale to be cost-effective, focusing on the productivity angle, whilst others looked at it more widely, as an educational tool. If people understand more about what is involved in food production and distribution, the argument goes, they will value it more, perhaps wasting less and making better choices. Others discussed food poverty, and communities isolated financially and geographically from healthy food options. We discuss these issues in Chapter 5.

Some participants looked at urban agriculture from an aesthetic perspective, suggesting that it might introduce welcome green spaces in cities:

> ***If you are in Manchester and London you might be miles from green spaces so the idea of an urban farm or a new green space might be more attractive.***
>
> ***Belfast, full-day workshop***

Throughout the activity, participants seemed to rely frequently on a bucolic view of agriculture, not seeing it as a heavily technologised industry. Some recognised this explicitly, reminding themselves that their picture of where their food is grown is not likely to be correct:

> ***In short I really like the concept of urban farming, as some of my posts will attest, but I have an image of how and where food should be produced and in the middle of the city isn't it. Ironically the food I eat currently most likely doesn't come from the type of environments I picture. Urban farms would need to market themselves really well. Image consultants needed.***
>
> ***Digital diary comment***

Very broadly, the approaches to urban agriculture with most support from participants had identifiable environmental and socio-economic benefits, such as reconnecting consumers with food, reducing transportation time (and cost) and promoting local produce.

As participants explored the different approaches to urban agriculture in more detail and as the deliberations progressed, they began to identify the potential benefits in more detail, as we discuss in the following chapters.

Chapter 4: Approaches

In this chapter we look at the key advantages and disadvantages participants identified about each urban agriculture approach, while wider points about the economic and social impact of each of the approaches are covered in Chapter 5. The chapter draws on outputs from the deliberations in the half- and full-day workshops, and from the online methods used in the project, such as the forum discussion and digital diaries.

As noted in 2.3.3 Face-to-face workshops , participants began discussions about the different approaches through reviewing the three case studies, which covered:

- Low technology: a community garden, illustrated by the case study on Grow NI, a farm in Belfast.
- Medium technology: aquaponics, illustrated by the case study on Farm:, a project in Dalston, London.
- High technology: commercial urban livestock, illustrated by the case study on the City Pig Farm, a design-led project from The Hague, Netherlands.

During the half-day workshop, the conversations about the economics and the different funding models indicated to us that we needed to include more variety so we included two more approaches to the discussion – a commercial garden and a community farm during the full-day workshop. This enabled us to explore how differences in ownership, operation and the distribution of surplus affected participants' views on the opportunities for realising health and other benefits of urban agriculture.

At the full-day workshops participants spent the first part of the day reviewing the five approaches in combination with different types of produce. This allowed them to develop and refine their views and provided a backdrop and context for the subsequent city building game. During these discussions participants frequently sought clarification or posed questions to the specialists, especially on questions of a technical nature. Having reviewed the different approaches, participants selected a range of approaches and produce and positioned these on the map of a fictional city, seeking to maximise the benefits they had identified and minimise any challenges.

4.1. Aquaponics

Aquaponics is a system of aquaculture where crops' roots are submerged into water and receive their nutrients from the waste produced by farmed fish.

Participants were very positive about aquaponics, describing it as efficient, self-sufficient and clean. Many were not familiar with it prior to the project and were surprised to learn about the number of aquaponic systems in the UK and globally.

The primary advantages identified with aquaponics were low water requirements, minimal use of pesticides and the closed nature of the system, whereby nutrients are recycled, and the possibility of siting projects in abandoned buildings and underground spaces. Aquaponics

produce was seen as fresh and high quality. When participants discovered that such produce could not be labelled as organic because it was not grown in the soil, they suggested calling it "aquaganic".

Reflecting on the use of and production of fish in aquaponics systems some participants wondered whether this approach could help us address the problems with overfishing and provide us with access to oily fish.

Aquaponics gardening systems are fantastic. It seems possible to even grow tropical plants in UK. Something after the 'Eden Project ' in large disused industrial buildings. Now that would be something!

Digital diary comment

When asked if aquaponics might be part of the agricultural mix in the UK, some participants responded positively, saying that the UK soil was polluted with chemicals and we needed to think of approaches that were not soil-based. One workshop participant noted that we should first ensure that we understand what role nutrients in soil play in plant growth and nutritional value and making sure that aquaponics systems are able to provide an equivalent nutritional substrate.

There was some scepticism about the need for aquaponics throughout the UK, suggesting that approaches need to be tailored to specific locations. Questions were also raised about the productivity and scale possible in urban settings.

This type of technique might be more suited to built-up urban spaces with more sunlight and derelict spaces with less rainfall, where as we have space and rain. That type of intensive at a large scale might not be suited at the moment in Belfast.

Belfast, half-day workshop

Perhaps because of their very positive response to aquaponics, participants were quick to find solutions to potential challenges associated with this technology. For example, they suggested producing high value crops to help to offset the set up and maintenance costs. In response to concerns about the high energy use, many expressed belief that technological developments would provide us with environmentally friendly sources of energy. Using solar panels and water turbines to generate a portion of the electricity required or equipping farms with windows were suggested as a way of making most use of available sunlight.

One participant added that having a system with low water use is more important as water is a finite resource.

We can harvest wind or solar energy but we can't make water.

London, full-day workshop

High energy use was seen as the main disadvantage of aquaponics and, for some participants, of sufficient concern that they would have rejected it immediately, if they had not heard about its other benefits.

4.2. Commercial and community soil-based gardens

***Community garden**: soil-based, community run projects that rely predominantly on volunteers. For the purpose of the city building game, it was assumed that community gardens were used only for plants and fungi.*

***Commercial garden**: soil-based projects that are run for profit. This definition was challenged by some participants and this is discussed in Chapter 6. For the purpose of the city building game, it was assumed that commercial gardens were used only for plants and fungi.*

Some participants saw commercial and community gardens as complementary approaches to each other and one group of participants in the Belfast full-day workshop even positioned them in close proximity, in the city building game, so staff could exchange knowledge.

4.2.1. Arguments relevant to both approaches

Given the similarities between the two approaches (soil-based, potentially land-intensive and exposed to weather conditions) some of the concerns expressed by participants were felt to apply to both community and commercial gardens. These mainly focused on the land requirements and soil quality. Participants, especially those in London, argued that much urban land is polluted and felt this would detract from the quality of the produce. The scarcity of land in cities was raised too, and led to questions about the appropriateness or feasibility of using it for agriculture – particularly for soil-based approaches such as gardens or farms - rather than for housing. This could shed light on why commercial gardens chosen in the city building activity were often positioned underground or on rooftops (for more detail see Chapter 7). Some participants suggested that community gardens might be located on common land, in parks or by allocating a small portion of allotment land to community projects.

Both approaches were seen as contributing to increasing the green space in cities. However, community gardens were seen to provide opportunities for volunteer activities or wider community access and therapeutic benefits that are less likely to be realised in commercial gardens.

4.2.2. Arguments specific to the commercial garden approach

Many of the participants, when comparing the community gardens and commercial approaches, felt that the later would have higher productivity. This was seen as an important advantage by some, while others worried that the transportation of significant amounts of produce could cause pressure on the urban transport system. Some participants also assumed that commercial gardens would have larger land and water needs than community gardens which would make them impractical in an urban setting. Participants tried to address those

challenges when discussing what locations would be most appropriate for the different approaches. This is presented in Chapter 7.

4.2.3. Arguments specific to the community garden approach

The community garden approach was widely praised for its social benefits such as increasing food education and strengthening community links. To many participants these factors were more important than the productivity levels. Some participants, however, particularly those in the London workshops expressed concerns that large cities' transient populations would make any community-run approach more difficult to run successfully.

4.3. Commercial and community farms

4.3.1. Commercial urban farm

Commercial urban farm: *for the purpose of this project we assumed that a commercial urban farm has crops and livestock and is run for profit. This definition was challenged by some participants and this is discussed in Chapter 6.*

Many participants were uncomfortable with the idea of a commercial urban farm, particularly a vertical one, with most concerns relating to animal welfare. For many participants any sort of compromise on animal welfare was regarded as a 'red line', which would make an approach unacceptable. Many participants felt that animals belong in the countryside and raising them in cities would be both impractical and cruel. Some participants expressed particularly negative views of the City Pig Farm feeling that its designs, one of which included accommodating pigs in a modified high rise office building, were unacceptable.

The life of a pig is bad enough even if it is raised on free roaming land. The City Pig Farm is extremely cruel for these intelligent animals. I think it would be better for them to never be born if this becomes the norm. Bacon surely cannot be that important that we need to put animals through truly unimaginably cruel existences?

Blog comment

Specialists explained that the conditions in urban farms might be no different to those found in many rural farms, and that animal welfare regulations would be applied. However, many participants insisted that the countryside provided the most natural and favourable environment in which to rear pigs. This raises the point made elsewhere in this report about how perceptions of urban agriculture might be based, at least in part, on a comparison with outdated and perhaps overly romantic views of rural agriculture.

Some participants recognised that their idealised picture of rural agriculture did not correspond to the reality and that having animals in cities could promote better animal welfare as people would be confronted with the reality.

We just want to shut it away in the countryside and not think about it. I think we need to be challenged.

London, full-day workshop

The City Pig Farm case study included an on-site slaughterhouse, and this raised further concerns for participants, who worried about the noise and smell. Others queried whether the model would be commercially viable unless it was implemented at large scale, which was something many felt uncomfortable with. Others drew attention to the complexity and cost of the design solutions in the City Pig Farm case study for removing smells, which included energy intensive air filtration systems and the use of a large transparent dome over the site.

Questions were also raised about meat consumption in general. Some participants referred to recent warnings, much discussed in the media, about processed meats being carcinogenic. Some participants felt that becoming vegetarian was a better solution than finding other places to raise livestock.

Whilst negative views predominated, some participants described the City Pig Farm as a good beginning and something to build on and improve in the future. They noted that some of the designs for the Farm involved greenery and used horizontal rather than vertical structures: this was seen as better for the animals, and therefore more acceptable, even though the space would be used less efficiently.

Some workshop participants became more positive about the City Pig Farm as discussions progressed. Their increased support was based on the possibility of solving what were seen as major downsides of keeping livestock in urban settings, which were animal welfare and smell. Some were willing to accept the approach only if there were additional educational benefits attached. The quote below illustrates how people can change their views during a dialogue process and how the experience and knowledge gained can influence their subsequent conversations. It illustrates too that, whilst we know people in dialogues do discuss the issues raised with their friends and family, the digital diary enabled this discussion to be captured and to form part of the data outputs from the project.

I explained to my friends how I was initially against the pig farming as funny as it may seem I got the feeling of pig trafficking, however right now a lot of pigs live in awful cramped conditions with little room to move and often in dirty uncleaned conditions. This system with pig farming would give the pigs freedom to move and enjoy a quality of life before the time came for slaughter. It sounds very efficient, just concerns of hopefully allowing pigs to experience open air somehow. My friends initially felt as I did but after I explained the positives and negatives and things that I had learnt they could see the benefits and warmed to the idea of the potential inner city modern agricultural pig farming.

Digital diary comment

4.3.2. Community farm

Community urban farm: *for the purpose of this project we assumed that a community urban farm has crops and livestock and is community run.*

The benefits of community farms were seen as similar to those of community gardens: the approach would connect consumers with food and provide educational benefits. Unlike community gardens, however, community farms were seen as more labour and land intensive and less attractive, mainly because of smell and waste issues.

It is not as cute as planting some crops.

London, full-day workshop

Most participants tended to think that animals living in a community farm would be there just for educational purposes and not raised for consumption, perhaps having a picture of current urban farms in mind. Those who discussed the option of slaughtering animals thought it would be a hard sell, particularly to children who would inevitably get attached to the animals.

As discussed in sub-section "Commercial and community soil-based gardens" of this chapter, there were doubts that any community-run projects could work in large cities with transient populations. This was seen as particular challenge to the community farm approach as looking after animals involved additional, time consuming activities, such as arranging regular vet visits or, if relevant, sending the milk to be pasteurised. These sorts of ongoing commitments were felt to be too much effort for an approach that would have low productivity.

Chapter 5: Impacts, benefits and opportunities

Having described the main advantages and disadvantages of the different urban agriculture approaches we now focus on the wider potential impacts, benefits and opportunities.

5.1. Educational opportunities

The potential for urban agriculture to educate and inform people about how their food is produced was seen as an important benefit across all strands of the project. Much of the discussion about the potential educational benefits of urban agriculture focused on non-meat produce. In part, this seems to be because overall, meat production in urban environments was seen as more complex and less acceptable than producing fruit, vegetables or fungi.

Bringing food production closer to where people live and helping them to engage with different agricultural approaches could, participants thought, encourage them to make positive changes to their diets, such as eating more fruit, vegetables, fungi and seasonable produce. Their appreciation of food would grow and their willingness to waste it would decrease. In both online and face-to-face activities, participants emphasised the importance of educating people about food production and healthy eating, from an early age.

People pay more attention to what's in front of them. Make food production 'everyday', 'the norm', not something that is done far away and by other people, and watch attitudes change

Online forum discussion

My grandchildren don't know that peas grow in pods as they only ever saw peas coming out of a tin.

Belfast, half-day workshop

Access to food production was also seen as a way of encouraging people to waste less food. Participants spent some time online and at the workshops discussing this issue, prompted at least in part by Hugh Fearnley-Whittingstall's 'War on Waste' television programme, which explored why Britain wastes so much food and how the supermarkets and fast food companies contribute to the problem. Prompted in part by a specialist's description of the benefits to distributors of produce of a uniform shape and size, which allows for the same number of apples or pears on a tray, in a box and in a crate, as well as appearing more aesthetically pleasing on the supermarket racks, participants also discussed how produce that is less than perfect in appearance or has cosmetic only damage could be valued and not wasted. One interesting suggestion, made in the Belfast workshop, was for community farms in urban locations to act as distribution points for produce rejected by supermarkets but still saleable.

Many saw a significant role for schools in helping to support this process of connection with food production and valuing of healthy food. When participants took part in the city building

game in the full day workshop many called for the creation of visitor facilities and shop fronts wherever possible, so that school children in particular could learn about food production. Many emphasised that commercial urban agriculture projects should make efforts to accommodate visitors too and some suggested that engaging local communities should be a core part of their corporate social responsibility activities. One argument made in relation to the Skygreens vertical farm in Singapore was that it did not matter if it was not productive if it proved successful in helping to improve people's understanding of food production.

Some participants went a step further and argued that forms of urban agriculture such as community gardens and aquaponics projects could be located within schools, so that pupils could learn about the processes and life cycles and produce some of their own food.

As a teacher in a primary school, I would like to see school grounds cultivated to grow crops (and perhaps rear some small wildlife - hens/goats. It would be fantastic to see real, sensible gardening ground created and to allow children to develop skills, knowledge and a connection over a long time - taking increasing responsibility over their seven years in primary schools and beyond. I would be very excited if this produce could become part of the school dinners and if waste from the dinners could be composted for the gardens.

Online forum discussion

Involving children in food production, either by them growing fruit and vegetables themselves or by giving them access to production sites was seen as a way of encouraging them to hold a more positive view of them – and to start eating them. Participants suggested that habits and attitudes towards food are often formed at an early age.

Meat production

Views varied on the educational benefits derived from raising awareness of and increasing transparency about meat production. Community farms were seen as providing a good day out for families and school classes, encouraging people to start thinking about where their hamburger or bacon comes from. Others felt that as they are at present, city farms obscure rather than highlight how food is produced, pointing again to a romantic view of agriculture as small scale and benign.

City farms - I love those these are lovely, it's very small scale children love them. Some have quite a few animals but still fairly small scale. It feeds into untrue romantic vision. People like them. City farms are often about taking on formerly industrial areas.

London, half-day workshop

The City Pig Farm case study provided a focus for discussions on raising awareness of meat production. This case study describes a design-led project which aims to educate people about the different life stages of a pig. It has a visitor centre and an onsite slaughter house. Some participants suggested it might be appropriate for adults to visit such a place while others

argued that there might be cheaper and less elaborate ways to educate people about meat production, such as television programmes and school lessons.

> ***You should know about how your meat is reared, but I guess is [the City Pig Farm] the right way?***
>
> ***London, half-day workshop***

Others noted that commercially viable hi-tech meat producers might be unlikely to open their doors to visitors since the reality might be shocking or unpleasant for visitors.

Discussion of the educational benefits of producing insects for food was limited to bees, where many participants discussed their role in pollinating plants and the need to safeguarding their habitats.

5.2. Social and community benefits

An exploration of the social and community benefits of urban agriculture tended to take the Grow NI case study in Belfast as the starting point. Many felt that community garden projects offer the greatest potential to strengthen communities and provide social benefits, since they bring residents together and require an ongoing commitment. Whereas, at least at present, city farms tend to have a more recreational focus and involve one-off visits and commercial ventures tend to have less scope to involve local residents as volunteers or to receive visitors.

The quote below provides further support for the argument that many participants' view of growing food in an urban environment, at least currently, is a small scale, non-commercial and low tech activity.

> ***Many of us live insular lives and we need to connect more with each other, and what better place to meet than where we are growing food? No technology required, just a good old connection with mother nature!***
>
> ***Online forum discussion***

In the city building game, used in the second workshop, all groups proposed community gardens because of the value they placed on the social and educational benefits associated with this approach. These benefits included:

- Forming new friendships and connections between people in an area
- Sharing or donating produce to neighbours, colleagues and others
- Reaching out to groups or individuals who feel lonely or isolated or suffering from mental health problems
- Helping people to build a connection with their area and develop pride in a shared endeavour

- Supporting team working, trust building and co-operation between participants

Participants argued that combatting loneliness and strengthening neighbourhoods and communities was also important in many urban environments. In the Belfast workshops some participants suggested that creating community gardens and other shared spaces could help to reduce crime and anti-social behaviour by encouraging people to become invested in their neighbourhoods and more positive about them. Participants in the Belfast workshop also pointed to the way in which community gardens located on the peace lines of their city had been positive in terms of improving relationships between different communities.

A number of participants - particularly those in Belfast - felt that the social and community benefits of community gardens were so compelling that the fact that they did not produce high yields or significantly contribute to global food security was not important.

At the same time participants – particularly those in the London workshops - posed some challenges and questions about the extent to which social and community benefits could be achieved.

- In the London workshop one group suggested that in areas with very transient populations it might be difficult to attract visitors and participation. Some pointed to community gardens and allotments in their areas which looked neglected.
- In Belfast, one participant noted in some areas there might already be very strong and cohesive communities, in which case participants questioned whether it would be worth establishing a community garden.
- In the Belfast workshop participants suggested that community gardens might have less of an appeal in their city compared with those who live in much larger 'grey and concrete' urban areas, noting that you could see the surrounding green fields from the city centre.

If you live in Belfast you are never too far rural and farming land and getting to a green spaces is pretty easy.

Belfast, half-day workshop

- One group of participants in London wondered whether we should be targeting the most vulnerable and needy groups or instead making community garden projects accessible to all. Following on from this, if a community garden project has too diverse a membership it could undermine the degree to which participants feel comfortable and able to connect with one another.
- One participant argued that to be successful, community garden organisers need to target and support the groups who stand to benefit the most, or they risk becoming a leisure activity for comfortable, affluent and time rich people. By contrast others felt that inclusivity and benefiting the largest number of people possible were of paramount importance.

5.3. Health impacts

5.3.1. Potential benefits

Improved mental health and well-being

Participants – particularly those in the Belfast workshops – spent lots of time exploring the therapeutic and mental health benefits associated with community gardens. This was partly because there were a number of participants who were themselves keen gardeners who recognised these benefits and some who were able to share local examples of what could be achieved.

> ***Camphill in Belfast is aimed at people with mental health problems a farming community for mental challenged people. The volunteer workers come from abroad and it's for people with mental health issues and works with Rudolph Steiner schools. They have a little café as well and they're a social enterprise. I think it's great how they teach people with mental problems to do new things.***
>
> ***Belfast, half-day workshop***

Participants suggested that participating in community garden projects could be a good stress reliever for full time city workers who might be physically inactive during their days. During the city building game one group of participant in the London workshop decided to locate their rooftop aquaponics and community gardening project on a government building. They suggested in their presentation that government workers would each be encouraged to do a certain amount of volunteering at the project each week, the rationale being that this might reduce stress levels and increase productivity, as well as strengthening relationships with co-workers.

Participants suggested other specific groups who stood to benefit from participating in community gardens. For example, many agreed with the Grow NI case studies focus on older people with many noting that it would be an ideal way to tackle loneliness and isolation amongst this group. Building on this example, participants suggested other groups who stood to benefit from the participating. This included people with severe mental health problems and those recovering from illnesses or drug and alcohol addictions.

At the Belfast workshop one of the specialists remarked on the lack of green spaces in towns and cities like Manchester and they cited evidence that exposure to natural and green spaces has a proven impact on reducing stress levels. Participants who learnt about this health benefit felt that it provided a further reason to invest in forms of urban agriculture which could help to 'green' our towns and cities, alongside non-productive approaches such as green facades.

Improved diets

Urban agriculture was seen as a way of making fresh fruit and vegetables more accessible and perhaps less expensive. Access to fresh produce wasn't simply a matter of cost: in Belfast,

participants pointed to 'food deserts' where supermarkets provided cheap frozen foods only, and no fresh produce was available.

> ***It's a good thing to be able to benefit people who couldn't afford food. We should definitely feed those who are not able to access fruit and veg, including the homeless. We need to focus on raising awareness.***
>
> ***London, half-day workshop***

When exploring hydro- and aquaponics techniques, participants asked about the nutritional value of plants grown without soil. Following discussion with specialists, they concluded that there was no negative impact. Workshop participants often highlighted the fact that plants grown using these techniques would not require pesticides because of the closed and controlled environment. This was a factor in their support for produce grown in this way, which they felt might taste better, be safer to consume and perhaps have a higher nutritional value than the same produce grown using more traditional methods. One factor contributing to this view was that, in an urban environment, transportation time would be reduced and food would therefore be fresher when it reached the table.

Another potential benefit of hydro- and aquaponics growing techniques was isolation of a micro-climate from the wider environment. Participants suggested that this might increase the types of produce that could be grown in the UK, giving access to foods that currently have to be imported.

Impacts on the wider health system

In addition to the potential health benefits of urban agriculture - particularly of community gardens - participants looked beyond individuals and communities to the wider health system. Some suggested that they could reduce NHS spending in the long-term, by helping to keep more people healthier and out of formal healthcare systems. One of the specialists encouraged participants to continue exploring this idea by telling them about a 'green prescriptions' project being carried out by NERC and Exeter University.[10] In discussing how this might work some participants suggested that more would need to be done to "quantify the evidence" in order to help to secure NHS investment in relevant urban agriculture projects. The improved outcomes they identified included reduced obesity, fewer long terms conditions like diabetes, better mental health and improved resilience which could see a reduction in the use of health services.

[10] http://www.nerc.ac.uk/latest/publications/planetearth/aut15-nature/

5.3.2. Health risks

One of the most frequently discussed health risks associated with urban agriculture was the potential for air and soil pollution to impact on the quality and safety of produce. When panel members were initially introduced to urban agriculture in the online forum it was quite common for them to raise this type of concern first.

The problem I see in producing healthy food is food grown on polluted land in areas of heavy traffic and industrial pollution will not be healthy

Online forum discussion

Participants at the workshops also raised these challenges. However, rather than viewing soil based and open air approaches as 'red lines' they tended to explore how these challenges could be avoided or mitigated. For example, in the Belfast group, participants at one table asked the specialist whether specific types of trees and plants could be used to form a natural barrier that could absorb or divert air pollution. Participants were encouraged to learn that this is an approach that has proven to be effective. A blog commenter also wondered if it might be possible to develop crops that are resistant to pollutants. Participants also suggested that as closed systems hydro- and aquaponics systems could filter the air and avoid harmful air particles although some recognised that this might be an energy intensive and costly process.

Contaminated soil was another concern. A specialist at the Belfast workshop explained how the soil on brownfield industrial sites often needs to be replaced before the land can be used and this is a costly and time consuming. This led participants to suggest that this provided a further argument in favour of non-soil based systems like aquaponics. Others suggested techniques such as using raised beds to avoid drawing on contaminated soil.

Not all participants felt air and soil pollution posed significant challenges for the quality and safety of produce. For example, one participant bought urban grown produce from local farmers markets and felt confident that the produce was clean and safe and many said they would be comfortable eating produce from community gardens. Taking a longer view, one participant suggested that air pollution associated with fossil fuels might become less of an issue as we develop clean and renewable forms of energy.

There is also the fact that as more and more vehicles are being developed, such as electric and hybrid, which produce less or no pollutants.

Blog comment

When it came to living in close proximity to livestock participants tended to say this posed a threat to their quality of life rather than a direct threat to their health. However, a small number questioned whether it might be possible for humans to contract diseases from some animals. Participants were informed by the specialists that it would be much more likely for

humans to pass on diseases to animals and for this reason contact between humans and livestock would need to be carefully controlled.

5.4. Economic and employment opportunities

While participants felt that the economic and employment opportunities presented by urban agriculture are important, they tended to spend less time discussing this topic.

Across both the London and Belfast workshops participants agreed that urban agriculture presented opportunities for people to learn new skills and gain employment. At present, agricultural skills are not part of the mix of skills likely to be required in urban environments. As one of the specialists noted, in the course of discussing the potential educational and employment benefits of urban agriculture, bringing food production into the city also provided opportunities for widening the range of skills and jobs open to people living in the city.

Commercial urban agriculture was seen as a way of helping to develop local economies and regenerate an area. Some participants also suggested that it the more profitable commercial projects would provide the best employment opportunities, providing an argument in favour of profit-rather than community-driven projects. Some ventures, such as hydroponics or aquaponics were seen as providing opportunities for local people to develop or apply technological skills.

Belfast participants suggested that university towns like their own or those with innovation centres could start up urban agriculture projects and focus on recruiting local people into paid positions or offering them training opportunities. This would also have the added benefit of creating stronger links between university students and the wider communities where they are based.

Chapter 6: Ownership and workforce

In this chapter we discuss different ownership and financing models. The benefits and disadvantages associated with public, or community ownership, social enterprises and private, profit-driven models were discussed primarily in the London workshops, receiving little attention on the Food Futures online panel. The discussion largely plays out familiar debates about the relative merits and disadvantages of different models of ownership, but in the specific context of urban agriculture.

The three broad categories of ownership discussed are:

- social enterprises - i.e. .businesses which have a social focus and reinvest their surpluses in community projects.
- private enterprises – i.e. businesses which are privately owned and run for profit.
- community or publicly owned enterprises - i.e. either state owned projects or grant funded community run projects. This model was mainly discussed in the context of community gardens and community farms.

When comparing the different ownership models, it became clear that different participants had different definitions of commercial – some thought that it was synonymous with private and large scale. Others, however, noted that social enterprises could also have a strong commercial footing and high productivity. Some participants felt overall uncomfortable with the word commercial and requested that the approaches used as part of the city-building game to be renamed to social enterprises.

6.1. Ownership

6.1.1. Social enterprise

One group of participants populated their city with only social enterprise urban agriculture projects. The primary benefits they identified were the opportunity to realise social benefits, such as those described earlier in this report. This was seen as a way of encouraging communities to be more open to the idea of having agricultural projects in their neighbourhoods. Some of those views stemmed from a strong distrust in large corporations.

Many people are turning away from big corporates because big corporates have let us down

London, full-day workshop

Some participants argued that if urban agriculture used public resources such as land, then they would expect the projects to be owned and run by the community.

Asked by the specialists whether such model could help us achieve global food security, participants argued that there was a place for a mix-method approach and that social

enterprises in the cities would be in addition to large scale private agricultural enterprises currently operating in rural areas.

6.1.2. Private enterprise

At the other end of the spectrum were those participants who thought that private enterprises would be better managed and have higher productivity, which in turn would make them financially viable. Some participants also felt that only private companies would have the resources and knowledge to develop urban agriculture to a level where it could be commercially viable. Privately funded initiatives were seen as a way of getting things going quickly, and that socially driven and community based projects would follow.

You've got to change people's perceptions about how food is grown so we thought that on a commercial scale, get it out there, get people used to it, and then those companies will have a social responsibility to do community-based things. We also wanted to get the maximum amounts of food to the most number of people and we thought the only way that could be done was on a commercial scale.

London, full-day workshop

As noted earlier, however, some participants thought that more controversial projects such as the City Pig Farm would need to have a community spin off to be acceptable to the local residents.

When you're putting in big projects like this, controversial things like pig farms, you need something good, a sweetener.

London, full-day workshop

6.1.3. Hybrid model

Differences in participants' views of the different ownership models can be traced back to their different interpretations of the role of urban agriculture (see Chapter 3.) Those who discussed it in the context of cities becoming more self-sufficient expressed a preference for commercial ventures while those who believed that urban agriculture should have a predominantly social focus (i.e. raising awareness, reconnecting people with food, strengthening communities) opted for a social enterprise model. Most saw urban agriculture as having multiple roles to play, so during the city building game, most participants chose a mixture of community and commercial approaches and tried to strike a balance between the two. Some even suggested links could be established between community and commercial projects so that knowledge and skills could be exchanged.

6.2. Workforce

Participants expressed doubts about the willingness of city dwellers to be involved in agricultural projects, particularly in types that are seen as time -consuming such as community gardens. Some participants noted that people in cities were time poor and would not have the time to tend to gardens. This view was challenged by other participants who pointed out that the long waiting list for allotments was an indication that there was a strong appetite for gardening in cities.

The question, however, about who would provide labour on urban agriculture projects was a recurring one, particularly in discussions of community-based approaches. The availability of workforce was one of the main criteria participants in the workshops looked into when deciding where to place certain urban agriculture approaches. For example, many felt that the community gardens should be close to residents or centrally located so locals could access them easily. One group decided to place a garden on the roof of government buildings so the employees there could volunteer half an hour a day and help out the employed garden staff.

Chapter 7: Land use and locations

In this chapter we look at participants' views on locating different types of urban agriculture and how what they found acceptable depended on the environmental impacts associated with different types of produce as well as the underlying goals of the project.

7.1. Overview

When introduced to the topic of urban agriculture one of the first challenges often raised was the high cost and lack of available land in towns and cities. Participants who made this point - online and in workshops - often made reference to the current housing shortage in the UK and rising land values, particularly in London and the South East of England. Many suggested that the imperative to build houses was "trumping" other considerations and competing uses.

Growing urban areas is a great idea but doesn't that government want to build 250,000 houses?

Online forum discussion

Several participants suggested that on the basis of these challenges our focus should continue to be on producing food in rural areas. Others suggested that urban agriculture sounded good in principle but noted that it seemed less feasible in London and the South East, where the priority is on house building.

Why give up a building when they could convert them into flats or offices?

London, full-day workshop

Responding to these challenges most participants at the workshops agreed that it would be unacceptable to introduce animals such as cows and goats into towns and cities if large areas of grazing land were required. By the same logic participants at the workshops tended to recommend projects and approaches which involved using land intensively and efficiently, such as aquaponics and vertical farming techniques and choosing animals such as chickens that require less space. A number of participants also recommended growing high value crops in order to maximise the return that could be achieved in small growing areas.

You can grow high cost products like shiitake mushrooms.

Belfast, full-day workshop

Given the competing claims on urban land and the power and wealth wielded by property developers, some participants suggested that there may be a role for government and policy makers in encouraging and supporting urban agriculture. For example, one online participant

argued for the need to make urban agriculture a requirement for property developers and they cited an example of this in France.

> ***France recently mandated that all new builds have roof gardens and I think a similar move in UK planning would help this (see the solar panel / RHI initiative) either way loads of flat and sloped roofs could be put to productive use…***
>
> ***Online forum discussion***

This sentiment was echoed in the London and Belfast workshops where a number of participants called for the creation of incentives, new planning requirements and funding streams to support urban agriculture. In Belfast participants who argued for this made the point that urban agriculture should not only be seen as a "cold hard economic question" given the range of benefits that could be achieved. During a number of conversations at the workshops it was recognised that in order to influence government policy it would be important to collect and marshal the evidence base about the various benefits of urban agriculture and the need case.

7.2. Different types of land use

During the workshops, as participants became better informed about the need case and explored the potential benefits of urban agriculture they tended to be creative and solutions focused about how urban agriculture could best be accommodated into urban spaces.

Many online and workshop participants saw urban agriculture as an opportunity to make use of spaces which were not currently productive.

> ***You would not demolish housing to have agriculture, but you can look at using unused or underused space***
>
> ***London, full-day workshop***

During the city building game at the workshops participants identified rooftops, vacant industrial plots and underground spaces as particularly suitable locations for urban agriculture. Having identified these spaces participants tended to explore the practical and logistical issues of the most sensible types of crops and approaches and the trade-offs that might be involved. For example, when one group proposed a community garden on a rooftop during the city building game they accepted the challenge from the specialists that these would not be as accessible as a ground level location but given that land is so limited they would need to make a compromise. Other suggestions at the workshops which were not explored in depth by participants included creating "floating farms" in the Thames and installing aquaponics

systems in land spaces that were too small or too polluted for developing housing or growing crops in the soil.

Another form of land use explored during the workshops involved the creation of temporary or "pop-up" urban agriculture projects. For example, participants in the Belfast workshop noted that there are a number of vacant shops on their high streets which could be developed along the lines of the Dalston Farm: project used as one of the case studies. Some groups during the city building game chose to create temporary farms and community gardens on the space of land in the city marked for development. Where farms were suggested, the specialists challenged participants to consider how different farming techniques and approaches might impact on the land and on the economic viability of investing in setting up a project that might be fairly short lived.

During the workshops participants explored how urban agriculture could be integrated into existing spaces. In the city building game it was common for groups to suggest the creation of community gardens in city parks, on the basis that it would be accessible to residents and that it would not detract from the parks primary use and value. When it came to commercial garden projects participants were less comfortable with taking a section of the park because this would undermine a valuable community asset for private gain.

In the London workshops one group emphasised that any proposed garden located in a park should be modest in size and would be most suited to larger parks or commons which could more easily accommodate this additional use. Some noted that protection from vandals and theft would be important.

As well as using land in city parks, both online and workshop participants suggested that allotments could accommodate community-led projects alongside individual plots, given that securing a plot in some London boroughs can involve waits of between 10 and 15 years. Other suggestions included locating community gardens or aquaponics projects in schools and in offices and the suggestion that we should be taking inspiration from Incredible Edible projects[11] which involves forms of guerrilla gardening and a city or town wide push to create edible landscapes.

In Leeds there are already urban spaces that are being planted with veg, herbs and salad stuff and looked after by volunteers, for anyone to harvest responsibly. Local councils get businesses to sponsor the planting of roundabouts, flowerbeds in parks, car parks etc. Why couldn't these be planted with food crops instead?

Blog comment

As well as providing new sources of fruit it was felt that edible landscapes would enhance rather than detract from urban spaces from an aesthetic point of view.

[11] http://www.incredible-edible-todmorden.co.uk/

7.3. Locating different approaches

Crops and fungi were welcomed in central and residential locations because they could have a pleasing or neutral impact on the environment and on residents' quality of life. By contrast, a frequent 'red line' across the online activities and workshops was any form of urban agriculture which involved keeping large numbers of livestock in open air spaces in a residential and highly populated areas. This was because of the potential for bad smells, noise and the uncomfortable or distressing spectacle of animals being slaughtered.
At the London workshop where the specialist suggested that indoor farms could minimise or even eliminate smells the group drew attention to the fact that a pig farm would be unpopular or rejected by Jewish and Muslim communities especially if there were onsite slaughtering facilities. This point led to a wider discussion about how and whether it would be important to take factors such as this into consideration, and whether other factors - for example, vegetarianism - would also need to be considered.

This aversion to animals in cities was strongly expressed in the London workshops and particularly by those who were self-confessed vegetarians and linked it with animal welfare concerns. However, a number of meat eaters also objected to the City Pig farm on similar ground and also noted that it could have a negative impact on their quality of life.

I am a meat eater and gladly so but I don't want it on my doorstop, it needs space. I have a neighbour who has chicken and you can hear them. You don't know what this might be attracting.

London, half-day workshop

Responding to the strong reaction about the bad smells associated with livestock, one participant at the London workshop questioned why urban residents were uncomfortable with something that was seen as normal and routine in rural areas.

People live next door (to animal smells) in the countryside. Why can't we?

London, full-day workshop

In the Belfast half-day workshop one of the specialists challenged participants who objected to potential smells and disturbance of urban livestock by noting that Belfast city airport was noisy, large and fume emitting and yet it was accepted or even welcomed by residents because of the economic and practical benefits that it brought to the city. These points might suggest that residents may have in part been reacting strongly to animals in cities because it was unfamiliar and challenged their ideas about what was acceptable or desirable in an urban space.

In several groups across the two locations it was suggested that towns and cities like London which have fewer green spaces, or which are further from rural areas might be viewed more

favourably by residents and achieve greater levels of engagement with local communities. Participants across the different strands of the project tended to recommend forms of urban agriculture that would be seen as aesthetically pleasing and which were well integrated into the urban environment so that they would be viewed as an asset or even a tourist attraction rather than as an eyesore.

At one table in the London workshop participants suggested that urban agriculture, and particularly approaches that are less aesthetically pleasing or which could negatively impact on quality of life, could potentially be pushed out to the suburbs and poorer areas on the basis that the more affluent and powerful residents could raise stronger or more influential objections or simply because the cost of land would make them unviable in these areas.

They wouldn't put [UA] in Westminster. There's hierarchy. Affluent areas don't want it in their backyard. They'll push it out to the poorer boroughs."

London, full-day workshop

Others speculated that presence of a pig farm in an urban area would be likely to negatively affect house prices.

Participants across the London and Belfast workshops felt strongly that any urban agriculture project which aimed to deliver social, heath or employment benefits should be located near to communities so that they would be visible and accessible to volunteers and visitors, support local employment and deliver produce to consumers with the minimum amount of food miles.

With a large unused warehouse in a residential area, you could have more interest with the people that live within that area and they would be able to put more effort into it, people who retired who want a bit more to do. Put the chickens in.

Belfast, full-day workshop

In the city building game, when participants developed a community farm located on the outskirts of the city on the disused docks the group emphasised that it would be crucial for the site to have good transport links such as a 'Boris bike scheme' if it was to deliver on its goal of educating and bringing residents closer to food production. By contrast, where commercial projects were proposed which would be "sterile closed sites" that were not visitor or volunteer friendly it was felt to be more appropriate to locate them on the outskirts of the city.

Chapter 8: Produce

In this chapter we discuss what types of produce participants felt comfortable with farming in cities and the reasons behind those views. We first look at the categories participants identified as important when deciding what types of produce they would like to have in cities. Then we outline participants' views on specific types of crops and livestock.

8.1. Overview

Rather than discussing specific types of produce, many participants engaged in debates about the factors that should guide this choice.

Some participants felt that as urban agriculture offers new opportunities, we should think carefully about what type of produce we should concentrate our efforts on.

> ***Do we need to think about something that is nutritional, or something that we do not get at the moment where there is a market failure or a gap in the market or something that is really expensively produced by somebody else…I wonder whether we need to focus a bit more given that this is a different model rather than just go carrots, we have millions of carrots anyway and they are 5p anyway. This is such a new opportunity, let's think differently. (Editor's note – comment in reference to aquaponics)***
>
> ***London, full-day workshop***

Views also differed depending on the type of approach discussed – for example, when discussing low tech approaches (such as community gardens and farms), participants tended to favour low maintenance produce while high and medium tech approaches were usually associated with high value produce that could offset the running and set-up costs. Seasonal produce was seen as fitting the community gardens best.

Some participants noted that any choice of produce would depend on the weather conditions we live in and that the dilemma we are facing is not what we should grow but whether we are ready to adapt our diets to consume predominantly locally grown produce.

> ***Seems to me that the highest yields are achieved when you grow the products that are best suited to the environment that you have to grow things in. So it is not really a case of shall we grow this or that, the decision is made by the environment. The challenge is whether we can adapt our diet to the use more of the crops that are best suited to being grown in the places that we decide to live?***
>
> ***Online forum discussion***

All of this is discussed in more detail below.

- **Efficiency**: participants tended to think that given the high cost of land in cities, any produce we farm in urban settings should be able to use available space efficiently. Therefore, preference was given to produce that could be grown vertically or have small land requirements overall. Participants also liked scenarios where two (or more) types of produce could be combined and benefit from each other – bees and orchards or chickens and orchards.

Produce that had quick turnaround, high return per unit of investment, high nutritional value and low maintenance needs were also strongly favoured. Some participants added that any adopted approach should be able to sustain itself and the chosen produce should allow for this to happen.

If you need investment every year, then what is the point (…) would it be better investing in a primary school or in an urban farm – it needs to be self-sustained.

Belfast, full-day workshop

Highly perishable crops were another group that some participants thought would be most efficiently grown in urban settings as the reduced time crops would spend in transit until they reach the consumers would significantly increase their shelf-life.

Despite participants' strong preference for efficiency, they rejected the use of genetically modified crops even if this would result in high productivity.

- **High value:** participants, particularly those in the London workshops, tended to favour high value produce (rare breeds, exotic mushrooms or trendy crops such as samphire) as they felt this would help offset the setup and maintenance costs of the medium and high tech approaches. In Belfast, participants stated that if urban agriculture produce had a higher price tag than traditional agriculture produce, they would not buy it. In London, however, participants were confident that there was a market for premium produce.
- **New types of produce:** there was also an expectation that urban agriculture could provide opportunities for new types of produce to be introduced to the British consumer such as new varieties of fish or long-forgotten native crops such as purple carrots.
- **Quality:** some participants identified quality as the factor that would determine whether they would accept city farmed produce. While urban grown crops were seen as fresh and therefore high quality, some participants expressed doubts about the taste of meat from urban farm animals as it would not be free range.

8.2. Views on animals

Workshop participants were on balance more open than online participants to the idea of raising animals in cities. Overall, however, participants found the idea of farming animals in cities difficult to accept, citing concerns over animal welfare, smell, noise, waste and diseases.

Most people nowadays would like to think of themselves as middle class, they do not want to have animals close to them.

Belfast, full-day workshop

Opposition was particularly strong when the possibility of slaughtering animals on site was mentioned (further details on this are provided in Chapter 7). Some participants believed that having animals close to consumers would have a positive educational aspect –in terms of both increased awareness about animal welfare and the health and environmental impact of meat consumption. However, even those who acknowledged the educational benefits of such approach, were often reluctant to accept farming animals in cities for slaughtering. There were also concerns that compared to crops, animals would have higher maintenance needs.
Views also differed depending on the type of animal discussed with participants feeling least comfortable with the idea of farming mammals in cities.

And pigs are big, they are mammals – they are kind of cute

London, full-day workshop

- **Cows** were the least popular choice as participant thought they would need a significant amount of land. Some also cited health and environmental concerns pointing out that people should reduce their red meat consumption and that cow emissions were damaging to the environment.
- Many participants felt uncomfortable with the idea of raising **pigs** in an urban setting citing concerns over smell, waste and pigs' vulnerability to diseases. Some noted that as human contact with pigs was not recommended, then pigs could not even be part of a visitor's centre. Others, on the other hand, were willing to accept having pigs as long as their living conditions were good and the smell was dealt with effectively. One of the reasons pigs were more acceptable than cows was because participants felt that pigs could live in enclosed space whereas cows needed open grazing fields.
- **Poultry** was overall accepted as participants thought that it was a good source of protein and relatively easy to look after. It was also noted that unlike cows and pigs which required separate enclosures, different types of fowl could coexist which would help with the overall amount of land required. Those who expressed opposition noted that poultry can be smelly, noisy and attract predators like foxes and rats. As with other animals, some participants believed that poultry should be roaming freely and cities could not provide the space for this.
- **Fish** was the least controversial animal group with the majority of participants expressing no reservations against it. Those who did, did in the context of their overall opposition to any form of intensive farming.
- Views on **insects** differed significantly between participants in London and Belfast, with Belfast workshops more sceptical about the idea. Overall participants embraced

the idea of farming insects for animal feed but there was less enthusiasm for using them for human consumption. Some participants also expressed reservations about using insects to feed the animals, suggesting that this is not natural.

- Some participants felt that consumers' taste and perceptions should be challenged and urban agriculture could be used to introduce new types of animals to the food market.

There are other animals that at present we do not associate with part of the food chain, during WW 2 guinea pigs were used for food because they could produce more meat, quicker on the same amount of food as a chicken. There are probably far more examples, which I cannot think of at the moment. It is all a question of thinking latterly & being prepared to change our attitudes to the way & type of food we could produce in urban environments

Blog comment

Some workshop participants' views changed over the course of the activities. During the half-day workshops a majority was sceptical about having animals in cities with some saying that anything bigger than a chicken would be impractical. During the full-day workshops, however, one group in London and one group in Belfast chose to have pigs in their urban farms as part of the city building exercise. This might be explained by the availability of a location (the former docks) that participants felt was suitable for the purpose – away from residents but with good transport links.

8.3. Views on crops and fungi

Unlike animals, crops and fungi did not evoke any negative sentiment and were overall accepted.

As already discussed in Section 8.1 strong preference was given to crops and fungi with small land requirements, high yield and quick turnaround. There was also a request for crops that could encourage the local biodiversity and attract bees.

Because of participants' tendency to choose "quick gain" crops, some expressed reservations about choosing orchards during the city building game because of their significant land requirements and long growing cycle. Some also added that fruits in community orchards tended to contain worms which could be off-putting. When, however, participants were presented with the option of having fruit trees scattered around the city or in public parks, many reacted positively describing orchards as being aesthetically pleasing.

In terms of challenges, some participants expressed concerns about the air and soil pollution in cities and the impact this may have on the produce. This was more often raised during the London workshop.

Chapter 9: Funding and viability

In this chapter we look at participants' views on the funding and viability of urban agriculture. The chapter covers points raised about non-economic benefits of urban agriculture, how it might be funded, and whether urban agriculture projects could be economically viable, including issues around competition, trade and supply.

9.1.1. Non-economic benefits

Participants online and in the workshops agreed that the wider benefits of urban agriculture needed to be factored in when considering its viability. They thought that benefits to health, education and well-being were valuable in their own right and that urban agriculture could realise cost savings for the public sector through the positive impact it would have on people's lives. Some participants, both in Belfast and in London, emphasised a need for such benefits to be better understood so that (local) Government funding decisions look beyond the direct cost and income associated with investments in urban agriculture schemes.

Making a profit should not be the main priority. How do you make a case to the funder to understand the holistic benefits of a community garden? How do you gather evidence that this is a good initiative and is worth investing in?

London, half-day workshop

9.1.2. Funding

To many participants across workshops and online strands the funding for urban agriculture was a central issue that needs to be resolved if food production is to shift towards urban areas. Several discussions revolved around who should provide the funding for community gardens, aquaponics farms and other urban agriculture ventures. While a few participants argued that schemes could or should be financially self-sustaining, most others thought that urban agriculture would only thrive if supported by an external funding stream. Some added this was inevitable especially for the setup phase.

Considering the wider benefits associated with urban agriculture, participants across workshops and online strands made suggestions as to why and how public funding should be allocated to promising projects. Central government was most frequently mentioned as an appropriate funder or co-funder, while the EU came up in the full-day workshop in London. Belfast workshop participants thought a cost-benefit analysis could help justify the public expense, as it would demonstrate how urban agriculture would realise savings on public services. In the same workshop, some participants questioned government's priorities in spending money, citing the London Olympic and Paralympic Games as an example of unsustainable expenditure. One online comment stated that government should not only fund urban agriculture schemes but also actively promote them; other online comments envisaged farming subsidies similar to those provided to rural agriculture.

Private funding was discussed in some detail during the London workshops. Participants liked the idea of funding from businesses that might use or sell the produce from urban agriculture, such as supermarkets or big restaurants. They thought that sponsoring urban agriculture projects could be appropriate as part of supermarkets' corporate social responsibility (as well as boosting their image), although a few participants emphasised the need to be careful that private money does not erode the community ownership of projects.

Other potential sources of funding suggested by participants across strands included:

- Crowdfunding
- NGOs
- Businesses operating from the City of London
- The Mayor of London.

9.1.3. Viability

Setup cost

One issue that participants – in workshops as well as online – thought would affect the viability of urban agriculture projects was the setup cost. To many participants this seemed a significant obstacle to profitable urban agriculture ventures. While a few participants commented that some forms of urban agriculture would have a relatively low setup cost, citing soil-based farms as an example, most were concerned that it would take too long for enough income to be generated to (financially) justify the upfront investment. The cost of land and, in the case of brownfield sites, the cost of replacement soil, seemed so high to participants that they would be difficult to offset by lower transport costs or high yields.

Availability of land and legislation about soil quality could be challenges for a community garden. Taking bad soil and replacing might be expensive and time consuming, and the costs of testing the soil quality. Could be a lot of red tape.

Belfast, full-day workshop

A few participants in the London workshops thought that a high setup cost would not prohibit a successful venture, as long as there is a sound business case and someone willing to make the initial investment.

Running cost

Participants also considered the impact of running costs on the viability of urban agriculture projects. In the Belfast workshops, participants referred to the local Michelin factory which was closed as a result of energy costs, saying that aquaponics farming might similarly struggle. Acknowledging this, participants in London workshops thought that advancements in technology meant that urban farms would be more efficient to run and that equipment like LED lights would continue to become cheaper. Nonetheless, others said that the cost of

establishing and maintaining hi-tech farming infrastructure was bound to present a challenge to an urban farm's viability.

Scale

Online and workshop participants thought that the viability of urban agriculture would increase with scale, expressing doubt about the viability of smaller scale farming projects. Several participants argued that cattle farming in an urban environment would fail to be commercially viable. They did see opportunities for food growing of sufficient scale to be profitable, citing rooftop growing projects and root vegetables as promising examples.

Some participants argued that if scale was an obstacle to achieve profitability, projects should be made larger so that they would be economically viable. A few participants in London workshops reflected on small-scale urban gardens, wondering whether they could have commercial prospects regardless of their size.

Making urban agriculture projects viable

Discussions at the Belfast full-day workshop contained some optimism about the viability of urban agriculture, with participants identifying examples of projects that had potential to realise profits. They thought that viability started with hard work and determination, citing the community farm in the city's Titanic Quarter as an exemplary venture. Other projects participants referred to included aquaponics in a warehouse and underground mushroom growing.

Self-sustainable / profitable

Participants to all strands discussed whether urban agriculture projects could be profitable, and whether they should be. To contrast some of the views reported above, saying that the wider benefits of urban agriculture warranted funding, some participants thought that urban agriculture projects should only be pursued if they could sustain themselves. One respondent acknowledged the wider benefits and their importance, but insisted that projects need to self-sustaining.

In the London and Belfast workshops, participants suggested that urban agriculture businesses would be far more widespread if there was a potential for them to run at a profit, taking their scarcity as an argument for their lack of economic potential. Other participants thought that the balance could quickly shift, especially with other factors (technology, food prices, politics) so susceptible to rapid changes. The wider economic picture was talked about especially in Belfast workshops, where participants reflected on the struggling economy and traditional agriculture sector, wondering how urban agriculture could thrive while other sectors needed support.

Several participants, particularly in the online strands, reflected on how urban agriculture could succeed economically despite the challenges. Some concluded that this would be unlikely because of the high overall cost, which would cripple businesses regardless of their yield. A few comments at the London full-day workshop contradicted this, with one expressing

confidence that urban agriculture could become profitable given some time and another citing the availability of rooftop space as an enabler of viable urban agriculture, particularly if used for growing lettuce or other fast-growing crops.

Competition

A small number of participants commented on competition issues. These comments were predominantly made by online participants, some of whom thought that urban agriculture could pose a further threat to the viability of rural agriculture businesses, who, participants noted, are already facing difficult market conditions. A few participants said that they would not expect urban agriculture to have a significant impact on the prospects of rural agricultural businesses, arguing that the scale of urban agriculture would remain small. One participant in the Belfast full-day workshop even suggested that urban agriculture would support rural farmers by raising awareness of their work. A few participants mentioned urban farm shops competing with supermarkets, suggesting that urban agriculture projects would need to sell their produce directly to customers to succeed.

Trade and supply

Across workshops and online comments participants talked about how trade and supply could affect the viability of urban agriculture. Several participants suggested that supermarkets and restaurants could buy produce from urban agriculture projects, especially if this would help them build their image of a responsible business. One respondent thought that businesses would only buy produce if they bought in to the social merit of urban agriculture, as it would be more expensive than the same quantity of produce from a large-scale rural farming business.

Online forum participants expressed mixed views on whether supermarkets would cooperate with urban agriculture projects. One participant thought they would try to neutralise the competition from locally grown and sold food, while another argued that the volume of food produced by urban agriculture businesses would be so small that supermarkets would hardly notice. Participants at the full-day workshop in London were enthusiastic about an idea to circumnavigate the supermarkets altogether by selling the produce from urban agriculture through a vegetable box scheme. They also suggested a farm shop as a way of reducing the supply chain.

A few participants thought that there was merit in exploring or researching what markets urban agriculture would be serving, with one participant suggesting that these may be niche markets.

Other comments

A few participants wondered how arguments about funding and viability of urban agriculture were connected with global food security. One thought that the types of projects featured in the discussions would have little impact in the grand scheme of food security, another

suggested that the most commercially viable produce for urban agriculture might make the least contribution to food security.

There were a few suggestions that big multinational companies and developers would get in the way of urban agriculture, as their financial interests lie elsewhere. London workshop participants also thought that there was a lack of strong communities in London, further reducing the potential for urban agriculture schemes to thrive.

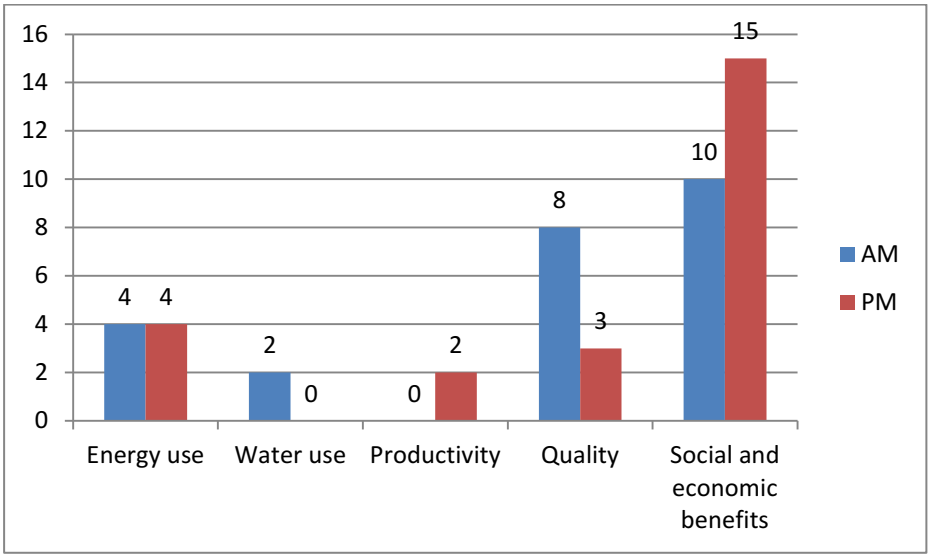
Chapter 10: Trade-offs and 'red lines'

As participants discussed and debated the benefits and challenges associated with different approaches, different types of produce and different city locations they were sometimes forced to make a number of trade-offs, where one characteristic or potential impact was considered to be more important than another.

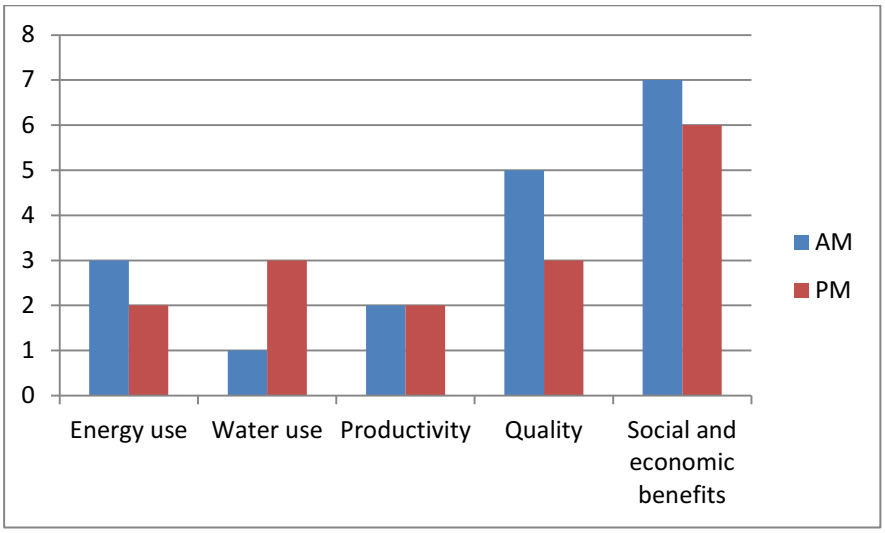
10.1. Voting in the half-day workshop

As part of the half-day workshop, we asked participants to review five priorities in relation to urban agriculture and select the top two that were most important to them in order of preference. The five priorities were energy use; water use; productivity; quality and socio-economic benefits. The vote was repeated at the end of the workshop to identify any changes in preferences as a result of the discussions. Below we present how many times each option was chosen as a top priority.

Belfast:



London:



Across both locations socio-economic benefits followed by quality were the two priorities most likely to receive top scores from participants. In Belfast we see that following group discussions, higher importance was ascribed to the socio-economic benefits which is in line with the broader findings of the project. Whereas in London a cluster of participants identified water use as more important probably because of their strong preference for the aquaponics approach (see Chapter 4 for further detail).

10.2. Trade-offs made during discussions

In this chapter we discuss what trade-offs participants were willing to make and the rationale behind those decisions as part of the workshop discussions. The characteristics that participants felt should take priority are presented below in green.

Scale and productivity of urban farms

Participants were consistently unwilling to compromise on animal welfare considerations (for example amount of space) even if this meant a project having higher productivity as a result.

Animal welfare	Productivity

This meant that commercial farm designs which involved multiple stories or more confined spaces were seen as less acceptable or were regarded as a ‘red line’.

Selecting produce for commercial gardens

When participating in the city building game it was common for group to select high value produce (for e.g. oyster and shiitake mushrooms) when they selected commercial garden projects in their cities. In these instances participants often prioritised the economic viability and sustainability of the commercial project over the extent to which it could provide affordable and accessible produce.

High value produce	Affordability and access to all

However, affordability and increased access to healthy food remained an important consideration. For this reason some groups selected other approaches in their city that could help to achieve this such as community gardens. But in other instances participants did not appear to make the connection between the fact that high value crops might compromise the affordability and accessibility of the produce.

The importance of socio-economic benefits

There were some circumstances where participants were willing to select less productive models and approaches because the socio-economic benefits were felt to be of primary importance.

Socio-economic benefits	Productivity

Rooftop community gardens

In one group participants were willing to locate their community garden on a rooftop. This involved an explicit compromise on its accessibility to the community based on the realisations that land in the city is in short supply and is expensive to purchase.

Efficient land use	Accessibility to the community

Locating community farms

Participants often chose to locate community farms away from residential areas. This was because potential negative impacts on quality of life were more important than locating the project near to the community.

Residents' quality of life	Accessibility to the community

Participants often suggested that good transport links to community based projects would be important for ensuring that they would remain accessible to residents that stood to benefit.

Soil and non-soil based approaches

Participants reacted very positively about the health and efficiency benefits of growing crops using non-soil based approaches such as aquaponics. These benefits appeared to be more important than any perceived break away from the 'naturalness' associated with soil based approaches.

Non-soil based crops	Soil based crops

As noted in Chapter 4, some participants coined the term “aquaganic” produce in their efforts to create a positive marketing brand for produce which was good for your health but which could not legally be labelled as organic, because it was not grown in soil.

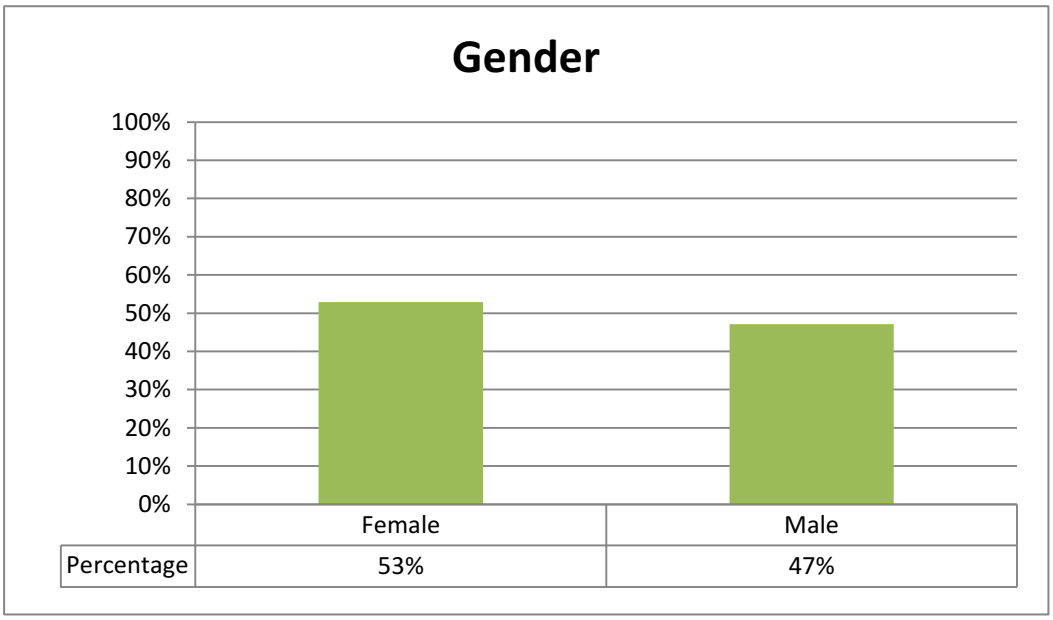
Appendices

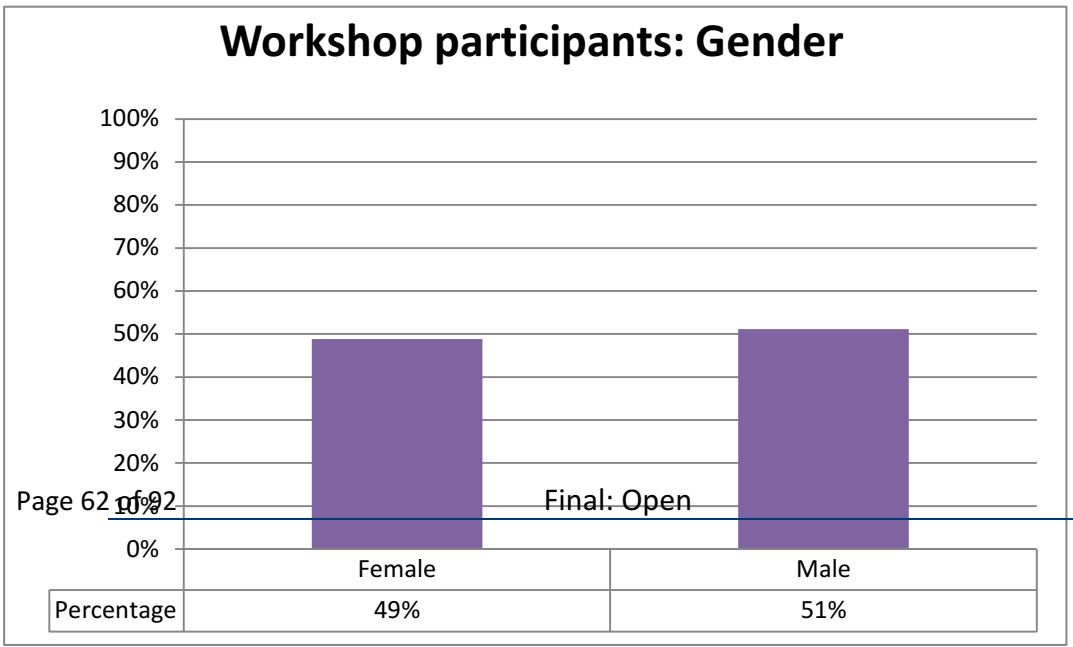
Appendix A: Sample table

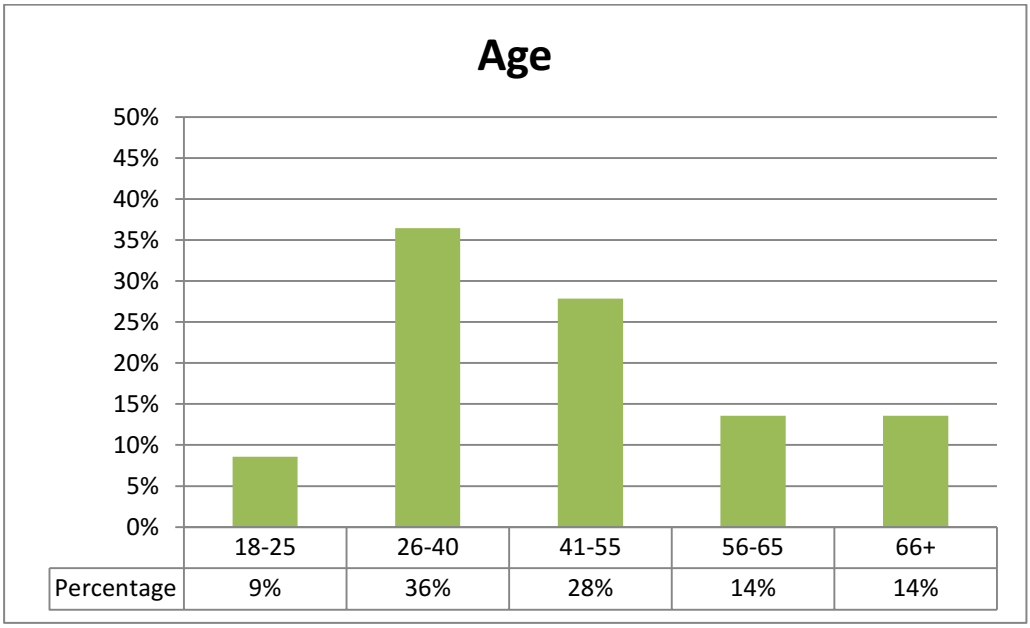
Graphs are presented for the main demographic groupings. We have presented this information for:

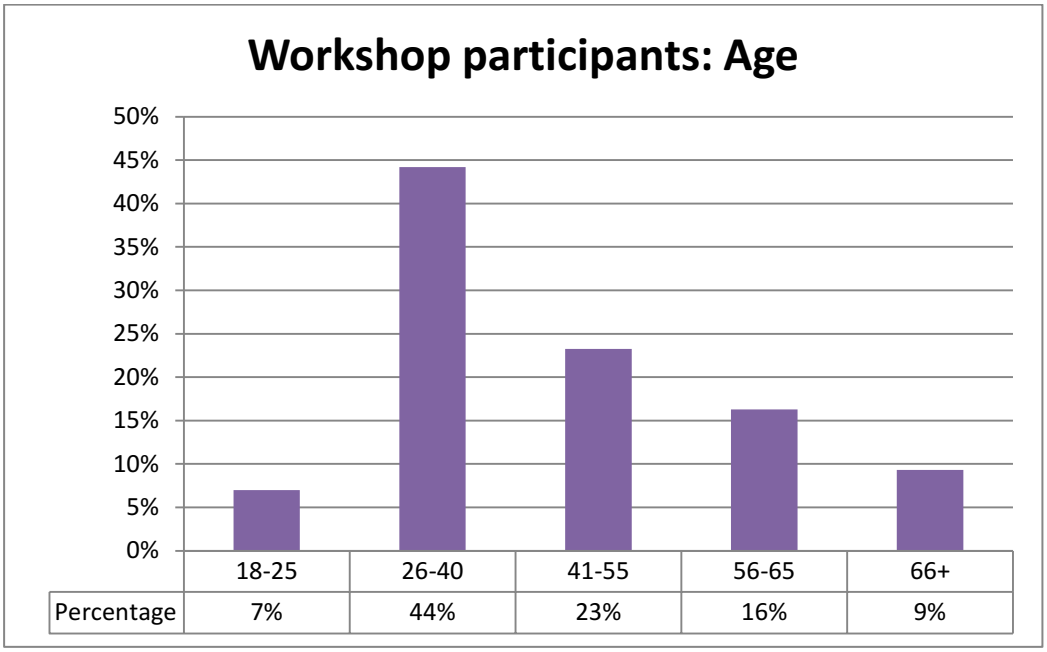
a) all participants who took part in any section of the Urban Agriuclture project

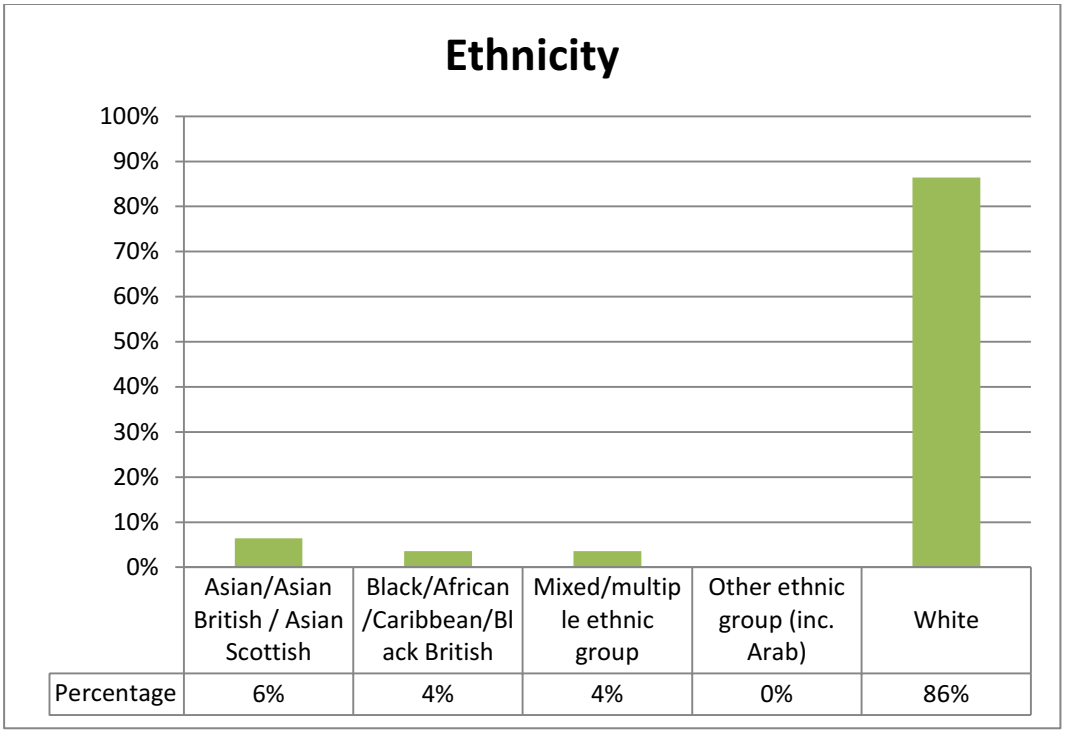
b) all participants who attended a workshop (in order to demonstrate any differences in our samples for face-to-face activities)



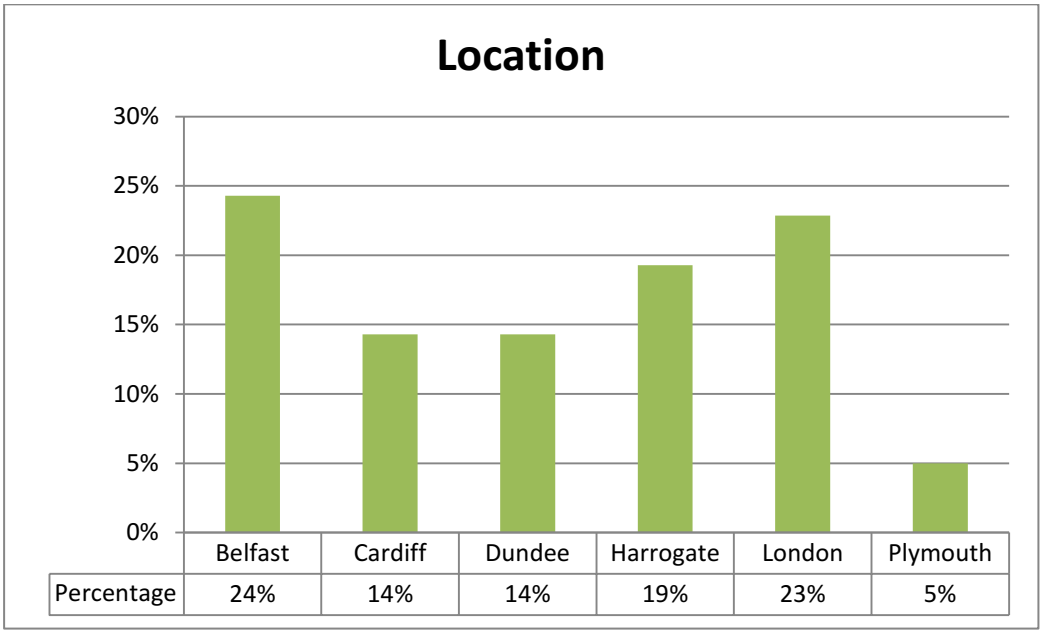


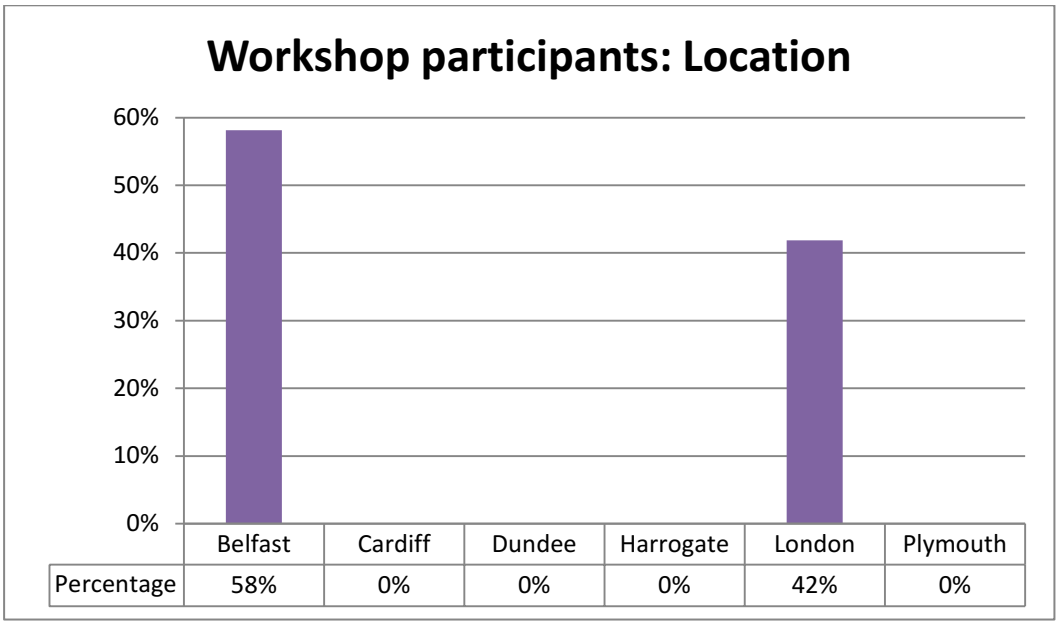

Age
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
18-25
26-40
41-55
56-65
66+
Percentage
9%
36%
28%
14%
14%


Workshop participants: Age
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
18-25
26-40
41-55
56-65
66+
Percentage
7%
44%
23%
16%
9%


Ethnicity
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Asian/Asian British / Asian Scottish
Black/African /Caribbean/Black British
Mixed/multiple ethnic group
Other ethnic group (inc. Arab)
White
Percentage
6%
4%
4%
0%
86%


Workshop participants: Ethnicity
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Asian/Asian British / Asian Scottish
Black/African /Caribbean/Black British
Mixed/multiple ethnic group
Other ethnic group (inc. Arab)
White
Percentage
9%
5%
2%
0%
84%


Location
30%
25%
20%
15%
10%
5%
0%
Belfast
Cardiff
Dundee
Harrogate
London
Plymouth
Percentage
24%
14%
14%
19%
23%
5%


Workshop participants: Location
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50%
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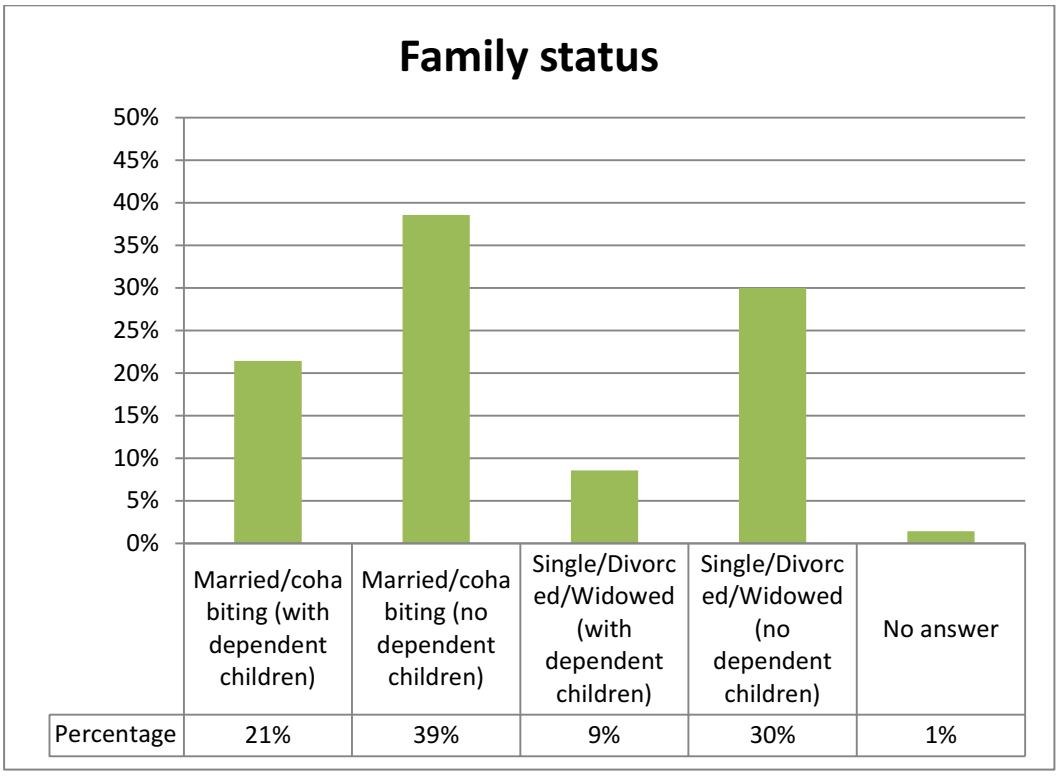
20%
10%
0%
Belfast
Cardiff
Dundee
Harrogate
London
Plymouth
Percentage
58%
0%
0%
0%
42%
0%


Family status
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
Married/cohabiting (with dependent children)
Married/cohabiting (no dependent children)
Single/Divorced/Widowed (with dependent children)
Single/Divorced/Widowed (no dependent children)
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Percentage
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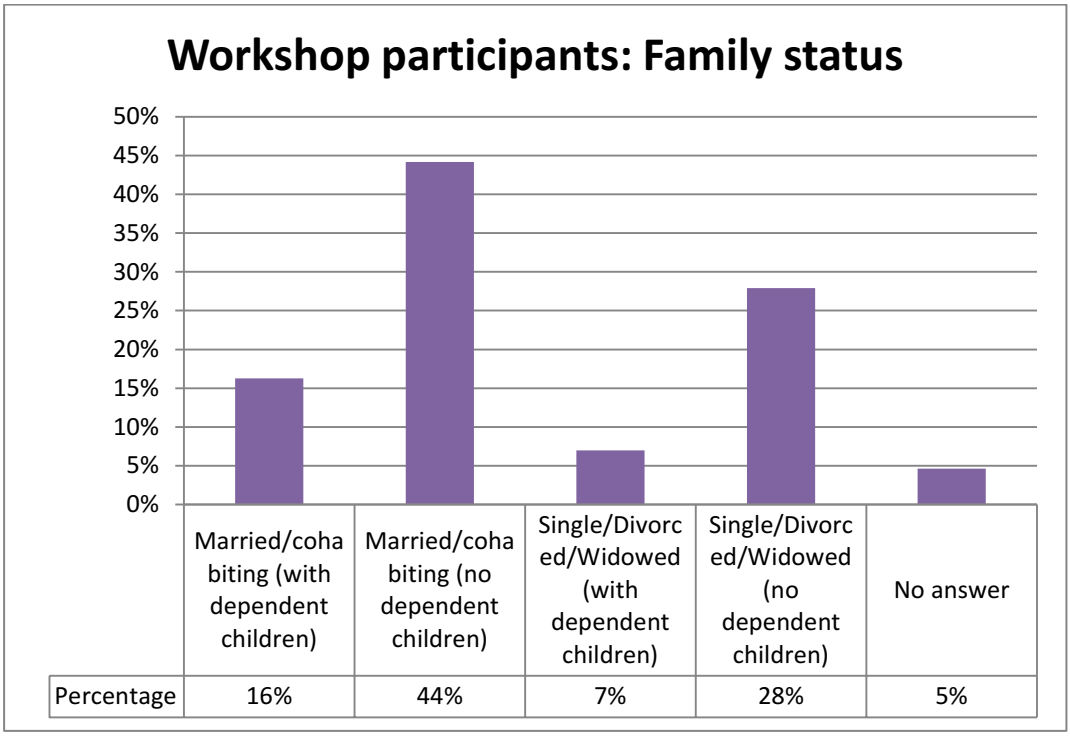
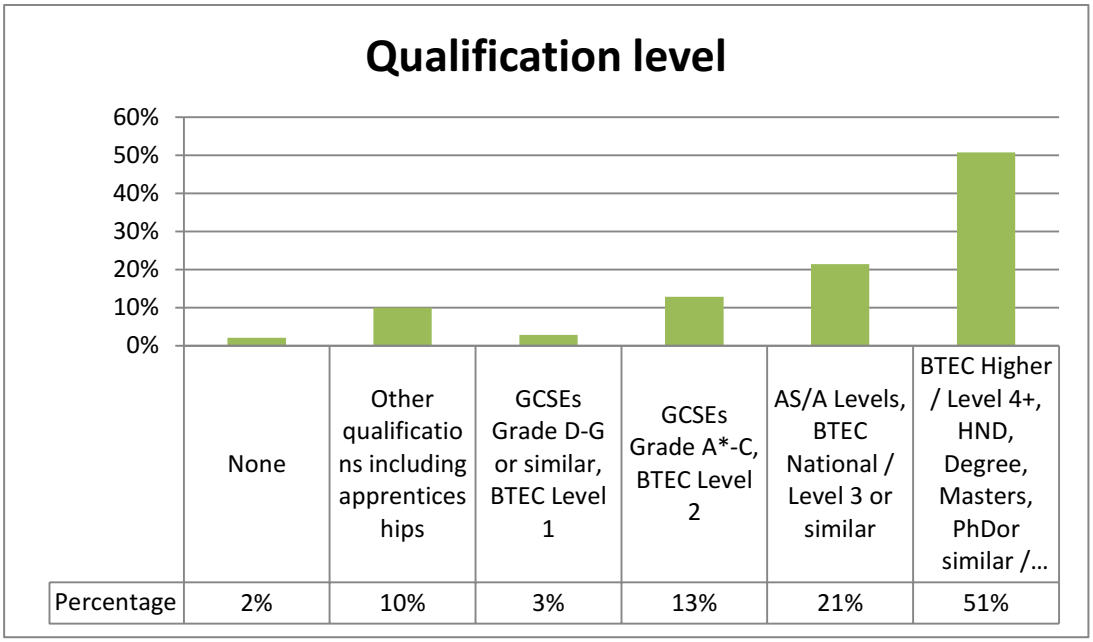
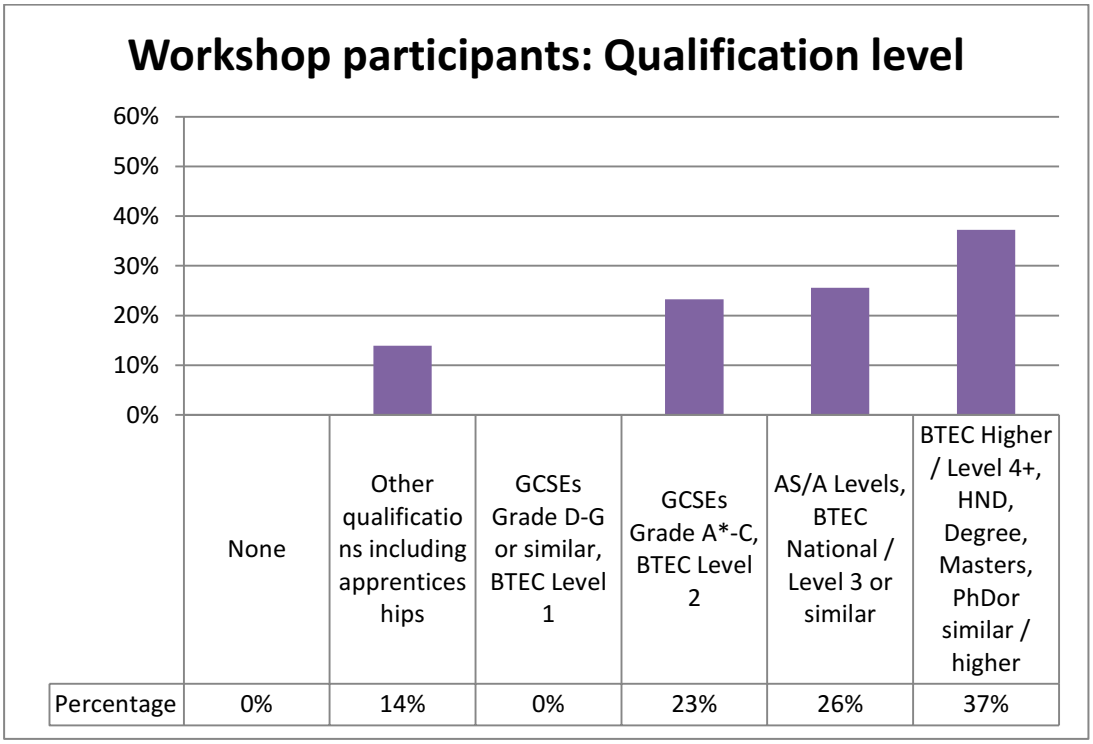
39%
9%
30%
1%


Workshop participants: Family status
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
Married/cohabiting (with dependent children)
Married/cohabiting (no dependent children)
Single/Divorced/Widowed (with dependent children)
Single/Divorced/Widowed (no dependent children)
No answer
Percentage
16%
44%
7%
28%
5%


Qualification level
60%
50%
40%
30%
20%
10%
0%
None
Other qualifications including apprenticeships
GCSEs Grade D-G or similar, BTEC Level 1
GCSEs Grade A*-C, BTEC Level 2
AS/A Levels, BTEC National / Level 3 or similar
BTEC Higher / Level 4+, HND, Degree, Masters, PhDor similar /…
Percentage
2%
10%
3%
13%
21%
51%

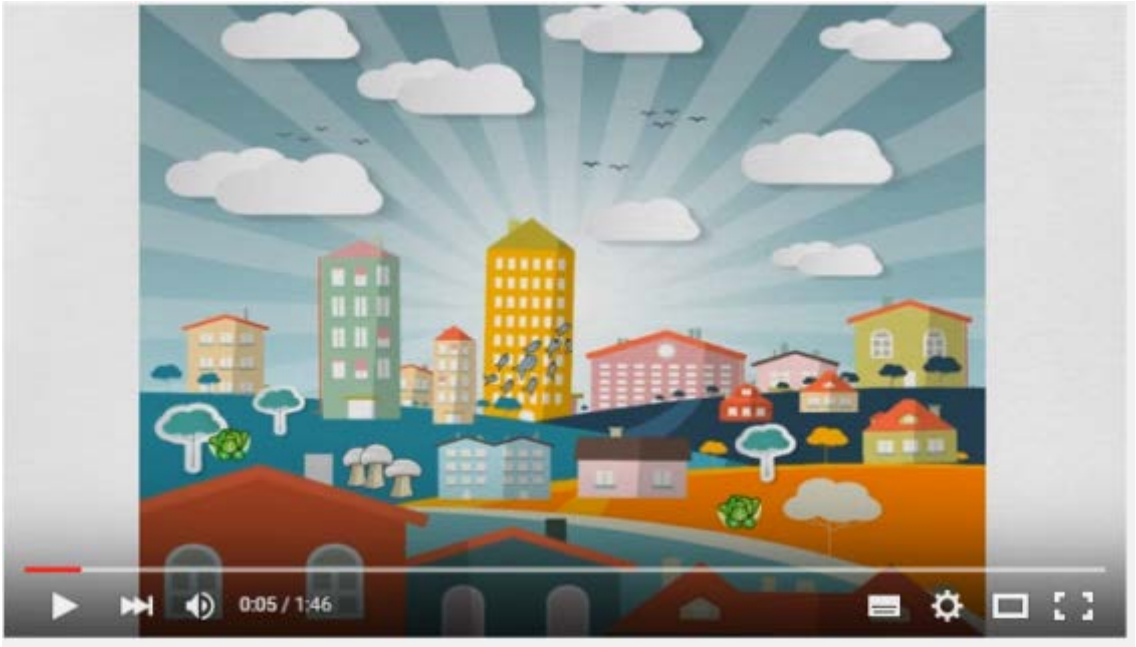

Workshop participants: Qualification level
60%
50%
40%
30%
20%
10%
0%
None
Other qualifications including apprenticeships
GCSEs Grade D-G or similar, BTEC Level 1
GCSEs Grade A*-C, BTEC Level 2
AS/A Levels, BTEC National / Level 3 or similar
BTEC Higher / Level 4+, HND, Degree, Masters, PhDor similar / higher
Percentage
0%
14%
0%
23%
26%
37%

Appendix B: Resource list

i. Introductory blog post and video(posted on the Food Futures online panel)

Food systems: what's it all about?

Over the next few weeks we want to find out what you think about urban agriculture. To start please have a look at the video below, after you've watched the video, read the rest of the blog for more information.



LINK: https://www.youtube.com/watch?v=s0mioti7ZbE

What is it?

Urban agriculture is the practice of growing plants, fish and livestock in and around our cities and towns. It can involve different methods and be located in urban centres or the outskirts of cities. Community gardens, urban farms that use aquaponics or hydroponics, rooftop greenhouses and underground farms, city pig or cattle farms and climate controlled high rises where plants grow under LED lights: these are some of the different methods used in urban agriculture.

As well as using different methods, urban agriculture can vary in scale and ownership too, from community-led projects staffed by volunteers to largescale commercial operations.

Why are we talking about it?

Populations are rising and more and more people are living in cities. People's diets are changing and climate change is affecting what we can grow in different parts of the world. We need to find new ways of ensuring that everyone can access safe, affordable and healthy food. We need to develop forms of food production which are less energy, nutrients and water intensive as resources become scarcer. The way we produce food now requires large

quantities of land, fertilisers, water and energy, particularly in animal-based production. Poor practices in harvesting, storage and transportation together with market and consumer wastage lead to large amounts of food waste, adding further pressure on a sustainable use of resources for food production.

What are the potential benefits?

Urban agriculture has the potential to deliver a wide range of social, economic and environmental benefits. These include:

- Increasing food production by making better use of urban spaces: for example, setting up gardens and farms on rooftops, vacant land and abandoned buildings.
- Freeing up rural land for crops that are best suited to growing in the countryside.
- Creating stronger and more interlinked communities and providing employment, education and training opportunities as city dwellers become more involved in food production.
- Providing fresher produce as production moves closer to home and yields are increased.

What are the potential challenges?

There are a number of challenges that need to be addressed too. These include:

- Developing the technologies needed so that we can use limited urban space effectively: for example, the right kinds of lights for underground tunnels, platforms that allow us to use the tops of skyscrapers or environmental clean-up methods so we can use brownfield sites safely.
- Dealing with the waste, noise, traffic and dust associated with food production, to minimise the impact of urban agriculture on residents' quality of life.
- Improving technology so that new forms of urban agriculture become less expensive, less energy intensive and more efficient.

Next steps

The benefits and challenges associated with urban agriculture will very much depend on the method that we choose, where we locate a project, what the local community needs and, most importantly, how people feel about producing foods of different types in an urban setting.

Please contribute to this discussion: tell us what you think about urban agriculture.

ii. Forum discussion guide

Stage 1: What is Urban Agriculture?

Objective: To introduce urban agriculture, including the need case, approaches, technologies and examples (XXX)[12], To explore panel participants' views on urban agriculture, including the underlying values driving these views (X), To explore differences in views on urban agriculture (X).

Stimulus: Initial blog post and video

Q. No.	Suggested question text	Facilitator notes	Purpose/rationale
	Welcome text: Welcome to the urban agriculture forum, I'm (tbc) and I'll be facilitating the discussion. I hope you had a chance to look at the video we posted last week and you are looking forward to talking about urban agriculture over the next couple of weeks. The forum will be a space where we learn, explore and share our views about urban agriculture. We want to hear as many views as possible – there aren't any right or wrong answers. Please ask as many questions as you want – we've got some specialists lined up to answer them later. In the meantime, if you have missed our blog and video, please find them here *LINK*. As a reminder, we'll enter everyone who takes part into a prize draw to win a 200 reward point bonus. There are three prizes available. This is the first part of the urban		Clarifying the terms of the activity, setting the scene.

[12] 3 'X's show where facilitators and activities are specifically designed to address particular objectives. 2 'X's show where facilitators will be briefed to explore or prompt on issues raised by participants that refer to particular objectives. 1 'X' shows where issues raised by participants that refer to particular objectives will be noted but not explored.

Q. No.	Suggested question text	Facilitator notes	Purpose/rationale
	agriculture activity. Later activities include workshops in Belfast and London so watch this space for more information.		
1	Is the idea of growing crops and raising animals in our towns and cities a new one to you, or had you come across it before?	Probe as appropriate: What do you think of the idea? Where had you come across it before?	To explore initial levels of awareness of UA.
2	Did anyone watch the introductory video about urban agriculture? What did you find interesting about it?	Follow up as appropriate, probe if panel members learning from each other.	Follow up to identify how much/ what parts of the top of mind response is based on exposure via the panel.
3	What do you think about growing foods in cities and towns? What sort of foods can you imagine being grown? What sorts of things do you think we might need to think about, to make it work? If want to know more, have a look at the article below that shows some examples of urban agriculture from around the world: **Next-gen urban farms: 10 innovative projects from around the world** http://www.theguardian.com/sustainable-business/2014/jul/02/next-gen-urban-farms-10-innovative-projects-from-around-the-world And here is something closer to home	Use prompts if no initial response.	Exploring initial awareness

Q. No.	Suggested question text	Facilitator notes	Purpose/rationale
	The Biospheric Project http://www.qub.ac.uk/research-centres/ArchitectureatQueens/Impact/UrbanAgricultureLaboratory/		
4	Do you know of any urban agriculture projects near you? Are you aware of any projects elsewhere in the UK? Or elsewhere in the world?	Explore type of project, produce etc. Don't stop people who want to talk about allotments etc. – explore if they understand this as agriculture or gardening. Use as prompts only if they don't emerge from previous discussion. Use articles only if question does not prompt response.	Surfacing existing views and knowledge of participants on the different types of urban agriculture and existing urban agriculture projects. Still exploratory: not feeding in too much information at this stage.
5	The Global Food Security programme defines Global Food Security like this: 'Global Food Security occurs when everyone has access to sufficient, safe, affordable and nutritious food, all of the time and in ways the planet can sustain in to the future.' What role, if any, do you think urban agriculture could play in achieving global food security?	Let this discussion run on to the topics below if possible. Prompt with 'why' questions where possible / appropriate	Gather views on the case for urban agriculture, in particular relating it to the environmental, social and economic dimensions. Gather views on the implications of different UA projects in terms of different purposes/impacts.

Q. No.	Suggested question text	Facilitator notes	Purpose/rationale
6	Do you have any questions around urban agriculture that you would like our experts to respond to next week?		Collect questions of participants around urban agriculture for the expert to respond.

Stage 2: Introducing potential benefits and challenges relating to urban agriculture

Objective: To explore panel participants' views on urban agriculture, including the underlying values driving these views (XXX), To identify "red lines" beyond which urban agriculture is not acceptable, and the factors that determine the positioning of these lines (X).

Stimulus: Expert response to questions raised in Stage 1. Prompt materials.

Q. No.	Suggested question text	Facilitator notes	Purpose/rationale
	Welcome text: Welcome back! Thank you all for your comments and questions so far –please keep them coming. As promised, our experts had a look at your questions and here is what they had to say *LINK*. Just to remind you that we will be sending our specialists another bundle of questions later this week so please use your chance to get yours in! Last week we dipped into the world of urban agriculture and now it is time to start exploring it in more detail. We're focusing on what you think the benefits of urban agriculture might be – and what challenges we might face too. Later in the week we will look at what types of food we might farm in cities.	Throughout: if participant makes a statement, explore this and ask if anyone has a different view.	Introducing the session, setting the scene
1	Before we begin, do you have any comments on the responses provided by our specialist?		Make sure that any outstanding issues/comments are noted.

Q. No.	Suggested question text	Facilitator notes	Purpose/rationale
2	Supporters of urban agriculture pick out a number of different potential benefits. For example, that growing food closer to consumers would reduce food spoilage by cutting transportation times ; it could, create a new use for abandoned sites or unoccupied rooftops and help us feed a growing urban population. People who are more critical note that land in cities is expensive and scarce and that cities are not equipped to handle agricultural activities. They argue that this could not be a model that can be commercially scaled up. What benefits or challenges do you think that urban agriculture might raise for us?	Let this discussion run on to the topics below if possible. Prompt with 'why' questions where possible / appropriate.	Provide participants with some information about potential impacts (positive and negative) of urban agriculture and specific examples of urban agriculture.
3	You'll have noticed that there are different types of urban agriculture. They use different technologies, they need different amounts of energy, some are quite small and others much larger. What do you think about the different types of urban agriculture? To jog your memory, have a look at our intro video here (LINK) and for those of you who want to find our more, here are some interesting articles exploring different urban agriculture projects: **1: Green rooftops** ***Cash Crops Under Glass and Up on the Roof*** http://www.nytimes.com/2011/05/19/business/smallbusiness/19sbiz.html?ref=topics **2. Community gardens/farms** ***The vegetable patches of east London***	Introduce the first question. Introduce other information. Use prompts if responses limited. Prompt on differences in views according to method: community farms, large urban farms, rooftop gardens, rooftop greenhouses and vertical farms.	Provide participants with some examples of UA projects and get them thinking about the potential implications of different projects.

Q. No.	Suggested question text	Facilitator notes	Purpose/rationale
	are the hopes of a new generation http://www.theguardian.com/sustainable-business/2015/apr/30/urban-food-growing-east-london-sustainability **3. Vertical farming** **http://cleanleap.com/food-growing**	Don't prompt on how views are impacted by different food products at this stage: this will be explored in Stage 3. If participants raise different food stuffs in the course of their posts spontaneously, then explore their views.	
4	What different challenges and benefits do you think are associated with different types of urban agriculture? Why do you think there are these differences? What different benefits and challenges do you think are associated with different types of foods produced in urban settings? Why do you think these are different? **Information to add if necessary:** The video we saw at the start of the urban agriculture activity talked a bit about urban agriculture helping us to reduce the cost of transporting food. Some specialists say that growing food closer to consumers would help us reduce transportation times which not only would decrease our carbon	Introduce as prompts only if they don't emerge from previous discussion. Throughout, probe participants on if/how their views differ according to method: community farms, large urban farms, rooftop gardens, rooftop greenhouses and vertical farms. Don't prompt on how views are impacted by different food	To explore how different methods and food types impact on participants' views of the benefits and challenges of urban agriculture.

Q. No.	Suggested question text	Facilitator notes	Purpose/rationale
	footprint but also would reduce food spoilage which often occurs when food is being transported over long distances. Some may express concerns that food grown on urban soil is not safe due to the higher air pollution in cities.. What are your views on this? What about growing food in a hydroponic system where fish waste is used to enrich the water crops grow into with nutrients? What do you think about this? Some specialists say that our diets would be healthier if we grew food closer to where we consume it as it would increase our knowledge of food and encourage eating in season What do you think about this? What about land? What are your views on unused areas such as rooftops, derelict industrial sites or disused underground stations being used for urban agricultural projects?	products at this stage: this will be explored in Stage 3. If participants raise different food stuffs spontaneously in the course of their posts, then explore them.	
5	How do you think urban agriculture might affect the way we think about the places we live in? (PROMPT on impact of different methods/food products.) How do you think that the benefits of urban agriculture would impact on different groups of people, or people living in different parts of a city? Would everyone benefit equally? How do you think that the challenges of urban agriculture would impact on	Use prompts if necessary. Prompt on differences in views according to method: community farms, large urban farms, rooftop gardens, rooftop greenhouses and vertical farms.	Situate urban agriculture within a wider context: explore people's views of how it might impact on the fabric of the city as a whole, and whether this matters to them. (Probing on underlying values)

Q. No.	Suggested question text	Facilitator notes	Purpose/rationale
	different groups of people, or people living in different parts of a city? Would everyone experience the same challenges equally?		
6	Based on the discussion so far, what do you think are the most important things for us to think about if introduce agriculture in urban settings? Why?	Recap what has been discussed so far to prompt response.	Gather views on the perceived most important factors (and why they are important) to take into account when introducing agriculture in urban settings.
7	Just to remind you that our specialists are on hand again and happy to answer your questions so please ask us what you want to find out more about.	Questions would be collected as we go along. Use as a reminder. Post answers once received.	Collect questions of participants around urban agriculture for the expert to respond.

Stage 3: What type of food might we grow in urban settings? Why?

Objectives: To explore participants' views on urban agriculture, including the underlying values driving these views (XXX), To explore differences in views on urban agriculture (XX), To understand the trade-offs participants make in determining the acceptability or unacceptability of urban agriculture (X), To identify "red lines" beyond which urban agriculture is not acceptable, and the factors that determine the positioning of these lines (X)

Stimulus: Expert response to questions raised in Stage 2. Prompt materials

Q. No.	Suggested question text	Facilitator notes	Purpose/rationale
	Welcome text: Hello again! For those of you who are just joining us, here is a short summary of what we have discussed to date: (INSERT SUMMARY) Today we will be broadening the discussion to get your views on what types of food we might grow in urban settings and the reasons why, if any, you think growing one food type rather than another is preferable.	Welcome new participants, people who may be just joining the discussion.	Introducing the session, setting the scene
1	Urban agriculture can involve growing fungi, crops such as lettuce, cucumbers and strawberries and raising different types of animal such as fish, pigs, chickens and cattle. What do you think about this range of food products being grown in urban settings? Have a look at these projects to get an idea of what is currently happening in the UK and abroad: Growing Underground, London (greens, herbs): http://growing-underground.com/ FarmUrban, Liverpool (vegetables, fruit): http://www.farmurban.co.uk/projects/ Hackney City Farm, London (pigs,	Use prompts if question does not prompt response.	Surfacing participants' views about growing different types of food, in particular relative to the distinction between crops and animals.

Q. No.	Suggested question text	Facilitator notes	Purpose/rationale
	goats, rabbits, poultry): http://hackneycityfarm.co.uk/animals Skyscraper Cow Farm in South Korea: (futuristic) http://inhabitat.com/grassy-green-vertical-farm-designed-to-raise-happy-cows-and-chickens/ Prompts: How are your views on the potential challenges or benefits of urban agriculture affected, when you think of growing lettuces rather than – for example – raising pigs for bacon and ham, orfish ?		
2	Have a look at these projects to get an idea of what is currently happening in the UK and abroad: Growing Underground, London (greens, herbs): http://growing-underground.com/ FarmUrban, Liverpool (vegetables, fruit): http://www.farmurban.co.uk/projects/ Hackney City Farm, London (pigs, goats, rabbits, poultry): http://hackneycityfarm.co.uk/animals Skyscraper Cow Farm in South Korea: (futuristic) http://inhabitat.com/grassy-green-vertical-farm-designed-to-raise-happy-cows-and-chickens/ How do you think people might feel about having a vertical farm growing lettuces in their city? What about a vertical farm raising cattle? How do think people might feel	Use prompts if necessary.	Exploring participants' views on what types of food would be acceptable in urban setting

Q. No.	Suggested question text	Facilitator notes	Purpose/rationale
	about this kind of urban agriculture in their city? Prompts: What benefits do you think raising cattle or growing lettuce in urban environments might have? What challenges? Explore issues relating to animal welfare: dealing with waste products: energy use: resources (e.g., feedstuffs, water, slaughter and butchery etc.) Explore issues relating to the use of pesticides and herbicides: EU regulations on this are being increasingly tight, growing crops in a controlled environment and using no-soil approaches can eliminate, or reduce significantly, the need for pesticides. Moreover, technologies such as hydroponics allow nutrients to be recirculated which means that fewer, if any, fertilisers are required.		
3	Urban agriculture produce might be sold to restaurants or directly on markets. Prompts: How do you think that urban agriculture might affect our diets? How would you feel if your next meal was burger and salad grown in an urban setting: would it worry you to eat it? Why/why not? And for vegetarians or people who eat fish but not meat – would you be happy to eat foods grown in urban	Use prompts if necessary. Explore whether changing variables (method of UA and type of food) impacts on views.	Exploring participants' views on eating urban agriculture produce.

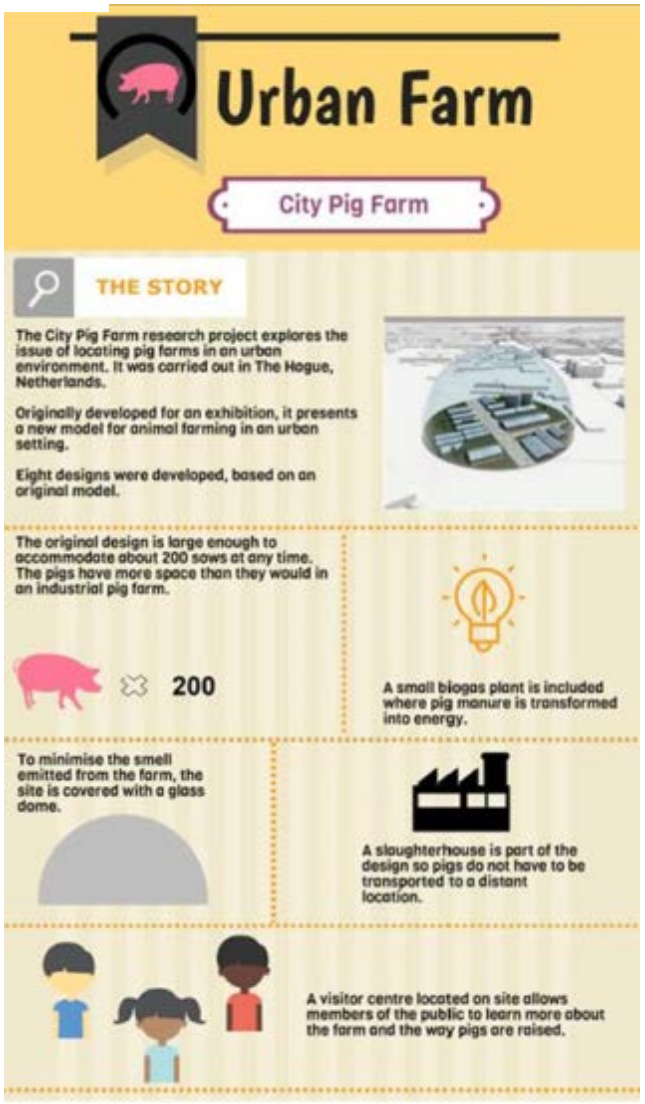
Q. No.	Suggested question text	Facilitator notes	Purpose/rationale
	settings? Why do you think this? Explore views around food safety, animal welfare, availability of fresh food. What role do you think urban agriculture may play in helping us to achieve global food security?		
4	Thank you and goodbye: Today is the last day of the forum discussion! Thank you all for your insightful comments, interesting questions and great suggestions. If you still have any burning questions left, please post them and we will publish the answers to those in a blog post over the next few days. In the meantime, stay tuned for more upcoming activities, including our workshops in Belfast and London. As always, we will publish all new activities on the panel's front page. Hope you enjoyed the last two weeks.		Thank participants. Remind them about upcoming activities and gather any remaining questions.

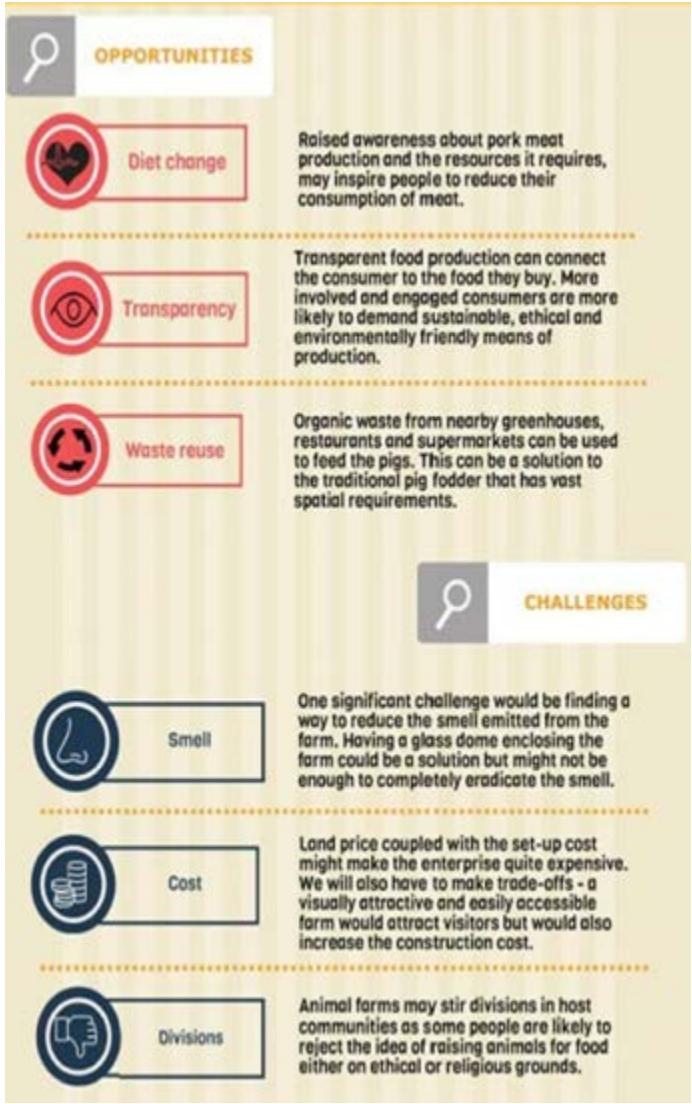
iii. Case studies (presented in half-day workshops)

Case study 1: City Pig farm

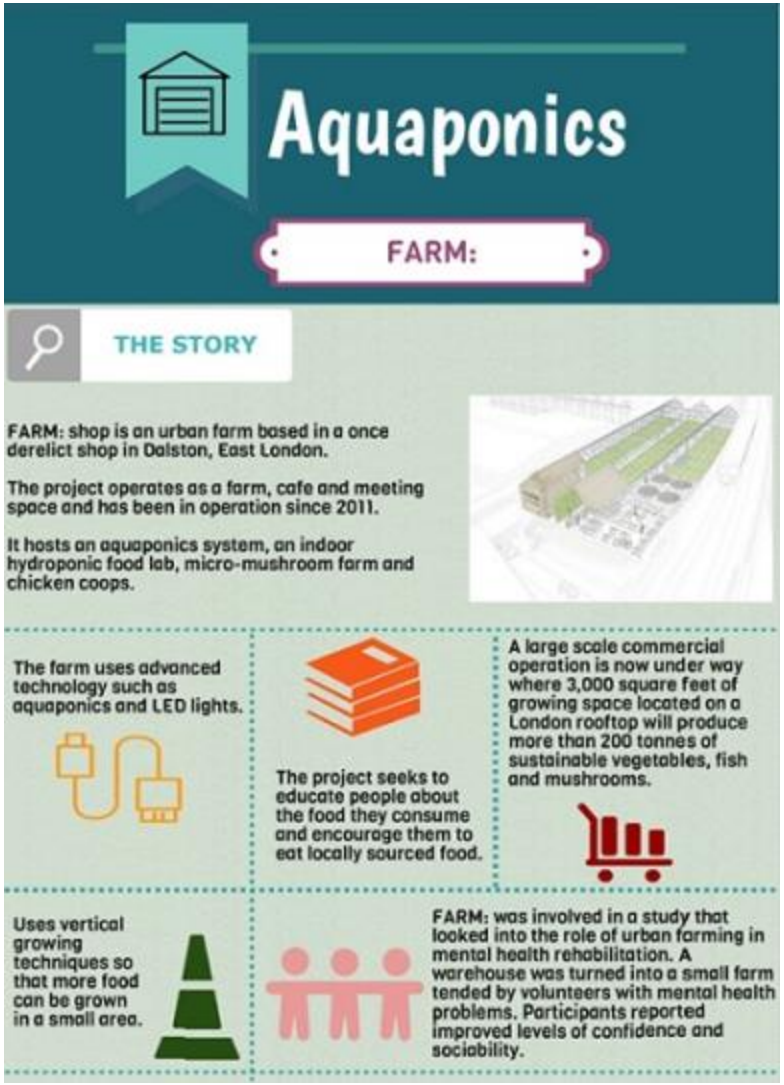
Link to video:

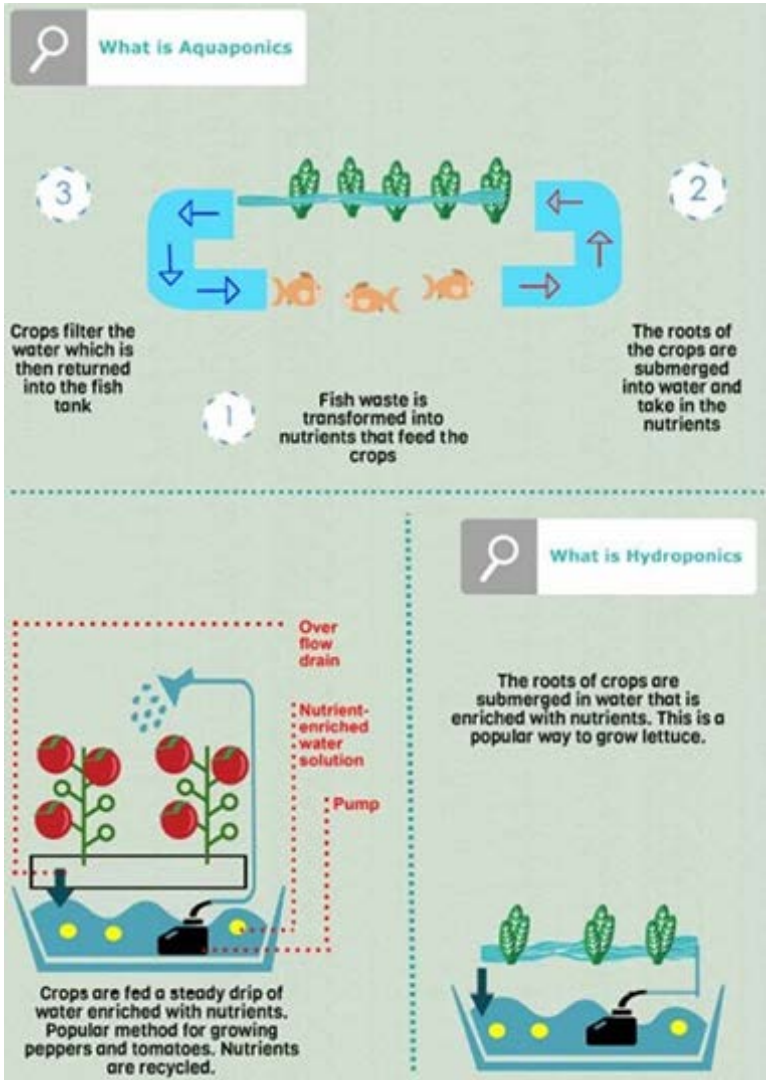
https://www.youtube.com/watch?v=FWTLhD2PXi0

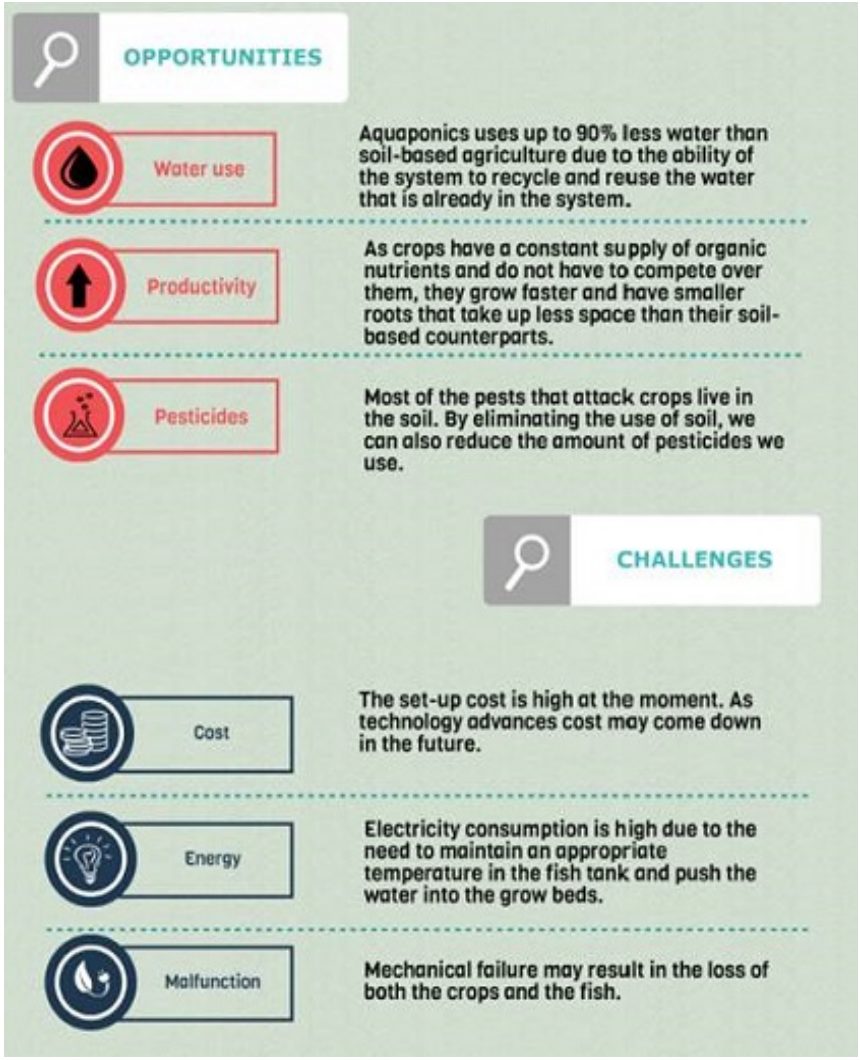

Urban Farm
City Pig Farm
THE STORY
The City Pig Farm research project explores the issue of locating pig farms in an urban environment. It was carried out in The Hague, Netherlands.
Originally developed for an exhibition, it presents a new model for animal farming in an urban setting.
Eight designs were developed, based on an original model.
The original design is large enough to accommodate about 200 sows at any time. The pigs have more space than they would in an industrial pig farm.
200
A small biogas plant is included where pig manure is transformed into energy.
To minimise the smell emitted from the farm, the site is covered with a glass dome.
A slaughterhouse is part of the design so pigs do not have to be transported to a distant location.
A visitor centre located on site allows members of the public to learn more about the farm and the way pigs are raised.


OPPORTUNITIES
Diet change
Raised awareness about pork meat production and the resources it requires, may inspire people to reduce their consumption of meat.
Transparency
Transparent food production can connect the consumer to the food they buy. More involved and engaged consumers are more likely to demand sustainable, ethical and environmentally friendly means of production.
Waste reuse
Organic waste from nearby greenhouses, restaurants and supermarkets can be used to feed the pigs. This can be a solution to the traditional pig fodder that has vast spatial requirements.
CHALLENGES
Smell
One significant challenge would be finding a way to reduce the smell emitted from the farm. Having a glass dome enclosing the farm could be a solution but might not be enough to completely eradicate the smell.
Cost
Land price coupled with the set-up cost might make the enterprise quite expensive. We will also have to make trade-offs - a visually attractive and easily accessible farm would attract visitors but would also increase the construction cost.
Divisions
Animal farms may stir divisions in host communities as some people are likely to reject the idea of raising animals for food either on ethical or religious grounds.

Case study 2: Farm:Shop urban aquaponics farm







Link to video:

https://www.youtube.com/watch?v=7-OHjpZapDw

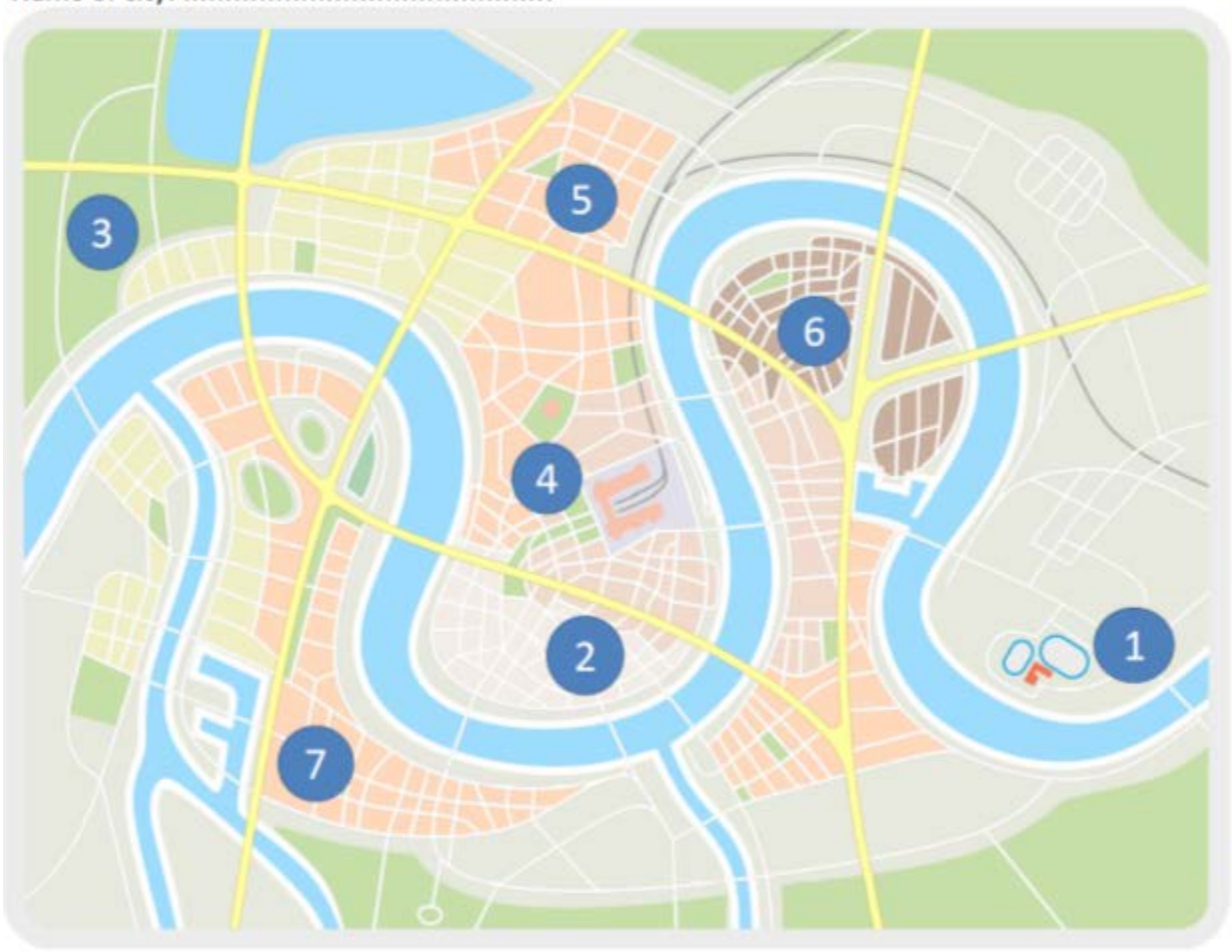
Case study 3: Grow community garden

Link to video:

https://www.youtube.com/watch?v=HNrzgi0KyQo

iv. City map, parameters cards and produce cards (presented in full-day workshops)

Name of city: .....



Locations

1. Former docks - located away from residential areas. The docks have been unused for decades.

2. Government buildings - this area of the city is occupied by a number of government buildings. All of their rooftops are currently unused.

3. Development land - this is a large piece of land ear marked by the council for development. Potential uses could include a housing scheme, a large shopping centre or a leisure park.

4. City park - this is a large park located in the city centre which includes trees, flower meadows and a pond as well as a children's play area.

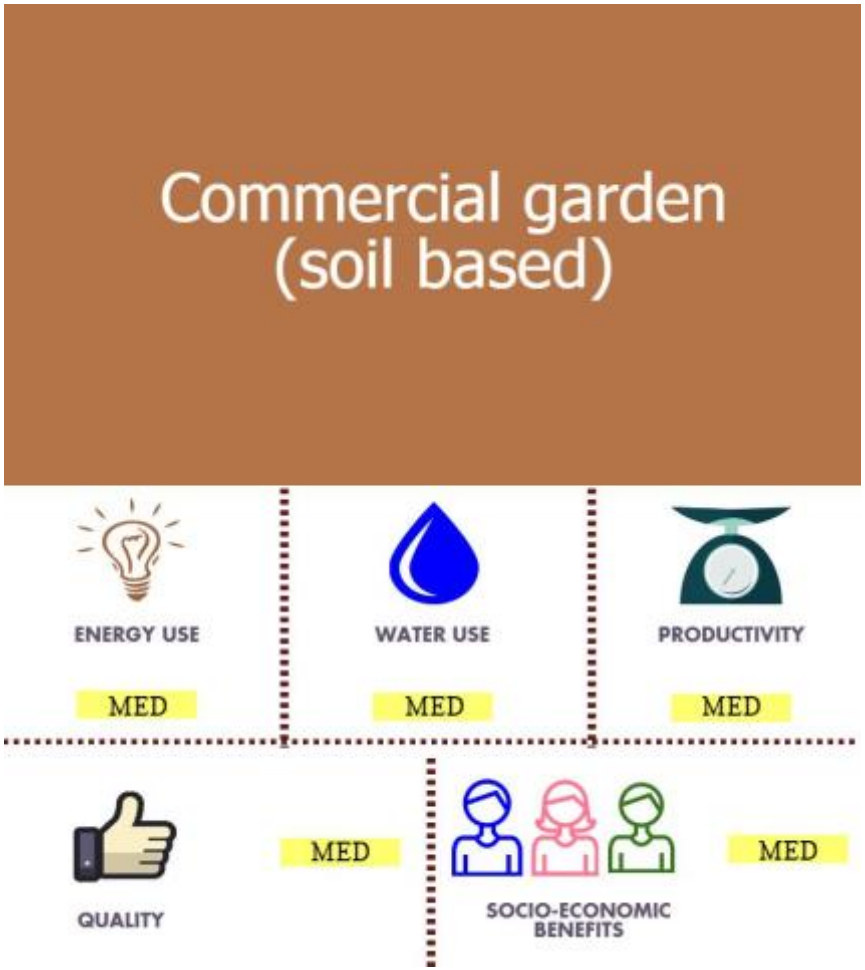
5. Vacant warehouse - a large unused warehouse in a residential area. The site has been rundown for many years.

6. Commercial offices - a number of commercial office building whose rooftops are not currently used for anything.

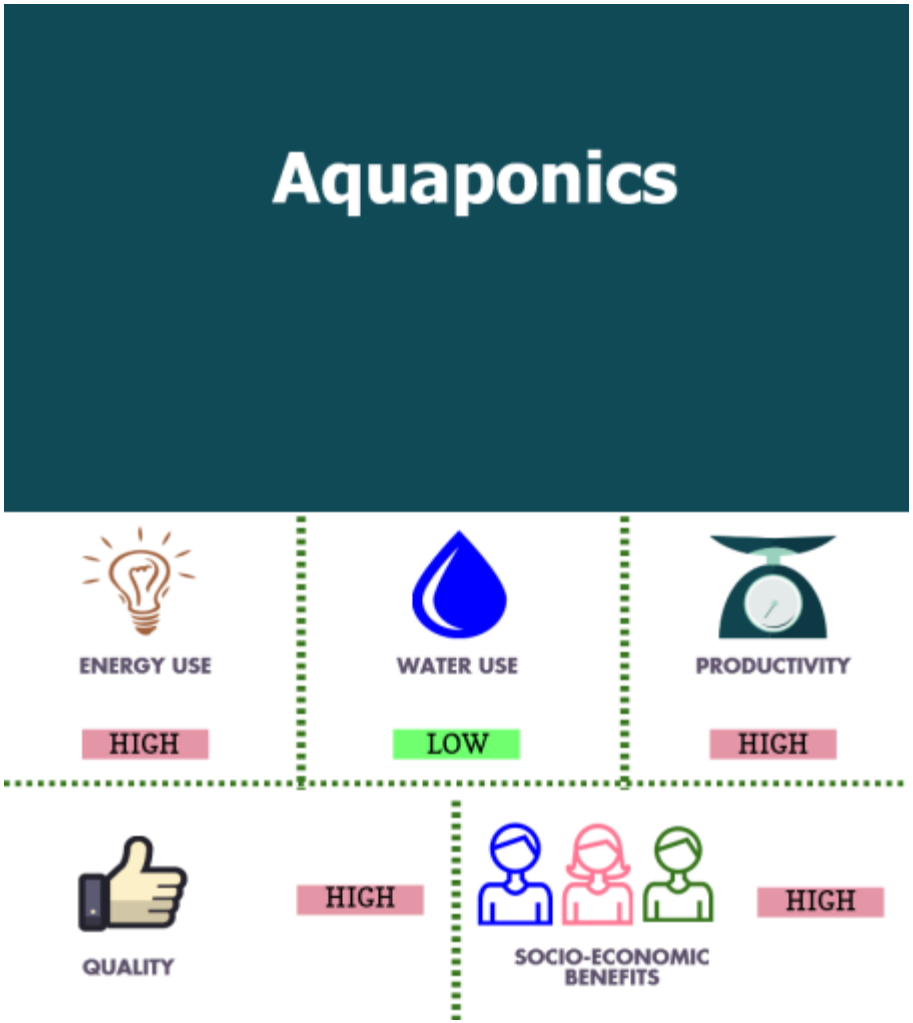
7. Underground space - dotted around the city are a number of underground spaces. These include former air raid shelters and car parks that are no longer used.

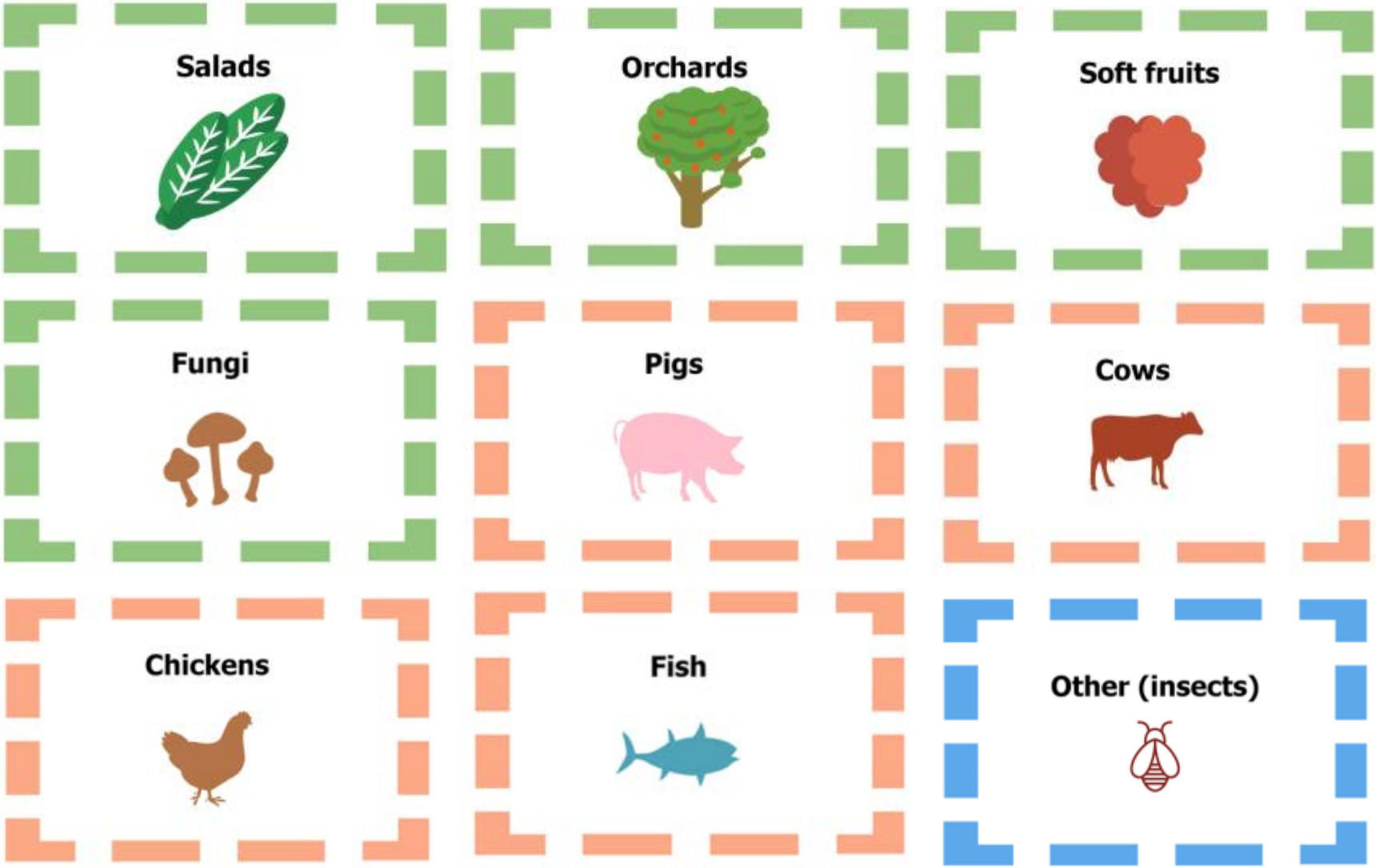

Urban farm
ENERGY USE
LOW
WATER USE
MED
PRODUCTIVITY
LOW
QUALITY
HIGH
SOCIO-ECONOMIC BENEFITS
MED


Community farm
ENERGY USE
LOW
WATER USE
MED
PRODUCTIVITY
LOW
QUALITY
HIGH
SOCIO-ECONOMIC BENEFITS
HIGH


Commercial garden
(soil based)
ENERGY USE
MED
WATER USE
MED
PRODUCTIVITY
MED
QUALITY
MED
SOCIO-ECONOMIC BENEFITS
MED


Community
garden
ENERGY USE
LOW
WATER USE
LOW
PRODUCTIVITY
LOW
QUALITY
HIGH
SOCIO-ECONOMIC BENEFITS
HIGH


Aquaponics
ENERGY USE
HIGH
WATER USE
LOW
PRODUCTIVITY
HIGH
QUALITY
HIGH
SOCIO-ECONOMIC BENEFITS
HIGH


Salads
Orchards
Soft fruits
Fungi
Pigs
Cows
Chickens
Fish
Other (insects)