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Sustainable Food in Manchester

Final Report

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1. Executive summary

1.1 Background

This report begins by providing overview of the current situation with respect to sustainable food in Manchester, and establishing a simple set of relevant and practical sustainable food criteria for policy makers to work from. We examine the extent to which, and the different ways in which, different food practices stand to be beneficial, since this is often complex and sometimes contentious. On the basis of this, and taking account of available expertise, momentum and goodwill across the city, and in collaboration with the City Council, we make broad recommendations as to the most effective actions for enabling sustainable food in Manchester. Our recommendations are not intended as the final word on Manchester's sustainable food agenda, but rather a basis for next steps.

It has become clear that there are two, largely distinct, parts to the sustainable food agenda in Manchester:

1. Enabling affordable, healthy diets for the less well off; and
2. Promoting an environmentally and socially sustainable food supply chains for Manchester, the region, the UK and beyond.

1.2 The current situation

Nationally, Defra has identified barriers to sustainable consumer choices as including decreasing consumer connection to food supply chains and a shift in the way food is valued, away from health and provenance toward price and volume. The proportion of people skipping breakfast has risen to 35% and ready meals and fast foods are on the increase at the expense of 'from scratch' cooking.

Manchester City is the 4th most deprived district in England, with 45% of the population living in areas within the 10% most deprived in the country. Food poverty is widely thought to be on the increase. Nevertheless, parts of Manchester are considerably better off.

Diet-related health is poor, with almost half the adult population being overweight or obese. Coronary Vascular Disease is the biggest killer, accounting for about 30% of deaths in 2010 (significantly higher than the average for England).

The average Manchester diet has a greenhouse gas (GHG) footprint that is estimated at around 3.1 tonnes CO_2e per annum[1], very slightly below the national average. Of this 46% comes from the consumption of meat and meat products and the associated supply chains. Food waste also contributes significantly to the GHG footprint. Globally 30-50% of food is wasted with 12% occurring post purchase (in consumer homes), 1% in supermarkets and somewhat more than 1% from manufacturers.

There are already a great many sustainable food initiatives underway in Manchester although collectively they account for only a very small proportion of the city's food supply. These schemes are often run by well informed and passionate people. They generally both enjoy and rely upon

[1] CO_2e = carbon dioxide equivalent (i.e. the global warming potential of each of the greenhouse gases included in the Kyoto Protocol: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6)).

much goodwill. Many are strongly wedded to organic principles. Schemes include community food and gardening initiatives with potential to benefit up to 6% of residents, waste reduction and redirection schemes, growers, and independent retailers.

Manchester has less than one thirtieth of the UK's land per capita available for the growing of food, and consequently limited scope for feeding itself or developing its very small agriculture industry. There is, however, considerable scope to source for more local sourcing, most of the environmental benefits of which are achievable by sourcing from the UK (without hot housing).

1.3 Core sustainable food criteria

We have adopted six core criteria for sustainable food in Manchester:

- environment;
- health;
- building social capital;
- mitigating the impacts of austerity on the most vulnerable;
- food security; and
- GVA and jobs.

1.4 The extent to which different food practices enable the criteria to be met

This is summarised in the matrix below, which crudely rates each action for its potential to impact on each of the criteria (with lighter shades representing actions with the lowest potential impact and darker shades the highest). Some highlights follow:

- The greatest benefits of community growing schemes are mental and physical health improvements along with building social capital and community. Resultant dietary improvements come more from attitudinal change than improved availability
- Environmental criteria are best met through dietary change, waste reduction and the promotion of organic production.
- Food security is best met by dietary change, sourcing from within the UK and reducing waste.
- The relief of poverty is most powerfully met through waste reduction at home. Other practices can help, especially through developing skills and enabling healthy lifestyles.
- Whilst there is not a compelling case for organic consumption on health grounds, there is a very strong environmental case for encouraging food production to move closer to organic principles, locally, nationally and globally.
- Although there is relatively little scope within the sustainable food agenda for generating jobs and GVA in Manchester, the overall economic case (including reduced health costs and improved productivity) for sustainable food in Manchester is compelling.

1.5 Recommendations:

- Support and value volunteers
- support community food initiatives;
- Education and skills in healthy and sustainable food;
- Trial healthy, sustainable fast food outlets;
- Support existing sustainable food enterprises in nurturing similar initiatives;
- Support public sector catering services, especially for schools, universities and hospitals, in providing healthy diets, sustainably sourced;
- Support the expansion of schemes that divert food from waste to people in need;
- Metrics: measure progress by monitoring impacts of schemes;
- Leadership and governance; and
- Lobbying and influencing national policy.

	Core Criteria/Practices	Environment	Health	Mitigating the impacts of austerity on the most vulnerable	Building Social Capital	UK Food Security	Manchester GVA & Jobs	Notes
Sustainable Production and Sourcing	Local - within Manchester							Low growing potential within Manchester.
	Local - within Greater Manchester							
	Local - within 50 miles							
	Local – UK							
	Grow-your-own							Environmental benefit is indirect through attitude change. Jobs through improved employability.
	Organic							Food security through land improvement.
	Seasonal and without air freight							
	Fair Trade							No impacts within Manchester but very important for poverty relief and building social capital worldwide.
Waste Reduction	Farm waste							Includes only Manchester farming
	Distribution & Retail waste							
	Consumer waste							Assumes poorer people incur average UK food waste.
	Catering waste							
Sustainable Diets	Less meat							
	Lower carbon meats							Shift from beef and lamb to chicken, etc.
	More fruit and veg.							Some double counting. We assume these actions bring about meat reduction.
	More cereals, grains and pulses							
	Less dairy							
	Less sugar salt and fat							
	Packaging reduction							

2. Introduction

The sustainable food agenda in Manchester is complex. There are many possible criteria by which to define sustainability, spanning social, environmental and economic domains. It is often not obvious which food practices can best bring each of these about, and sometimes the criteria compete against each other.

In terms of understanding the current situation in Manchester, usable local datasets are not commonly available, nor, generally speaking, will they be feasible to develop or monitor for change within realistic budgets. Understanding what is going has required a mixture of extrapolation from national data, anecdotal evidence, observations and crude estimates drawn from best available data.

Amidst these challenges, this report sets out to provide evidence-based guidance for policy makers, based on a structured analysis and with as much rigour as could be achieved within the constraints of a £20,000 budget.

Our report stands on the shoulders of a great deal of existing literature and analysis, and in particular, the following Manchester-specific policy documents:

- *Scoping the Baseline for Sustainable Food Consumption and Production*[2]
- *Manchester: A Certain Future - 2013 Update*[3]
- Food Futures reports:
    - *Growing Manchester Final Evaluation Report*[4]
    - *Evaluation of the Manchester Community Food Coordinators*[5]
- *The Total Carbon Footprint of Greater Manchester*[6]
- *The Economic & Social Benefits of Reducing Greater Manchester's Total Carbon Footprint*[7]

2 Ellen, D., 2010. Scoping the Baseline for Sustainable Food Consumption and Production.

3 Connor, S., et al., 2013. Manchester – A Certain Future – Updated for 2013.

4 Kazmierczak, A., Connelly, A., and Sherriff, G. 2013. *Growing Manchester* Programme: Final Evaluation Report.

5 CLES Consulting, 2011. Evaluation of the Manchester Community Food Coordinators.

6 Small World Consulting Ltd, 2012. The Total Carbon Footprint of Greater Manchester: Estimates of the Greenhouse Gas Emissions from Consumption by Greater Manchester Residents and Industries.

7 Small World Consulting Ltd and Ripple PRD, 2013, *The Economic & Social Benefits of Reducing Greater Manchester's Total Carbon Footprint*

3. Method

Our process has been as follows:

1. Develop a sense of the current situation in Manchester.
2. Establish a set of criteria for sustainable food in Manchester, that will be both sufficiently holistic and practical in the context of Manchester policy making and which do not contain implicit judgements as to the importance of specific food practices
3. Establish a shortlist of food practices which stand to improve Manchester's performance against those criteria.
4. Understand the extent to which each of these food practices stands to impact upon each criteria.
5. Understand the extent to which different actors can influence different practices.
6. On the basis of the above, establish broad recommendations for action, based on a blend of feasibility and impact against the different criteria.

The evidence base for this report has come from a review of literature and in-depth interviews with people working within Manchester's food system.

Little baseline data exists, nor will it be feasible to fill all of the gaps in the foreseeable future. However, where Manchester-specific data is unavailable, we have often been able to make extrapolations from national data, mapped onto Manchester's demographic. Anecdotal evidence, especially from sustainable food projects on the ground, has also played an important role in establishing the current situation.

In order to guide us through the process of prioritising actions for Manchester we have developed a matrix which provides a simple visual summary of the bearing that each food practice stands to have on the different sustainability criteria. We have sought to populate this matrix, based upon the best available evidence and with reference to the Sustainable Food Cities Network (a summary of which is provided in Appendix 1). Our recommendations are not intended as the final word on Manchester's sustainable food agenda, but rather to encourage actions that we believe, based on our findings, take Manchester in the right direction of travel. Inevitably priorities will evolve, and will therefore need to be revisited periodically.

A summary of the literature is provided in Appendix 2. Appendix 3 Contains a list of interviewees, followed by an overview of some of the existing sustainable food schemes, which are presented as a series of case studies.

4. The current situation

Manchester City is one of ten districts within Greater Manchester. It has a population of 493,000 and a land area of 116 km^2, of which 55% is green space or domestic garden. Whilst poor health and poverty are the most pressing concerns for many residents, the city also has a role to play in helping to enable a transition to a more environmentally sustainable food system for Manchester, the region and the UK. It is clear that within Manchester there are already a great many sustainable food initiatives underway but that their collective influence is still very small compared to the scale of the challenge. Effective policy will require clear thinking and prioritisation in order to scale up the impact.

It has become clear that there are two, largely distinct, parts to the sustainable food agenda in Manchester:

1. Enabling affordable, healthy diets for the less well off; and
2. Promoting an environmentally and socially sustainable food supply chains for Manchester, the region, the UK and beyond.

For the former, nutrition and cost are paramount, but provenance is less critical. Conversely, for the latter, provenance is all important but price sensitivity somewhat less so. One area in which these two strands converge is around community growing and gardening initiatives ('grow-your-own').

An overview of the current issues and actions to address them follows.

4.1 National food behaviours and trends

A recent review of evidence for Defra[8] identified two core barriers to sustainable consumer choices:

- The lack of connection between consumers and food supply chains and food preparation. In particular, urbanisation and increasing detachment from the land are identified as key drivers of this trend.
- A shift in the way food is *valued*, in which price and volume, rather than health and provenance, are increasingly dominant means by which UK consumers are determining the value of food.

In terms of specific behaviours, the report highlighted four key developing trends in UK food habits:

- Skipping breakfast (35% of UK people now do this).
- The rise of ready meals which are often poor in terms of nutrition and provenance, although this need not be the case.
- The rise of take-away meals which similarly do not need to have poor sustainability credentials although they often do.
- A reduction in cooking 'from scratch'.

The same report identified a range of drivers for poor food behaviours. Those most relevant for Manchester include lack of availability of sustainable food, lack of knowledge about healthy diets and poor cooking skills.

[8] Best Foot Forward, 2013, Review of Evidence on Consumer Food-Related Behaviours that Impact on Sustainability: Final Report EVO541,

4.2 Deprivation and food poverty

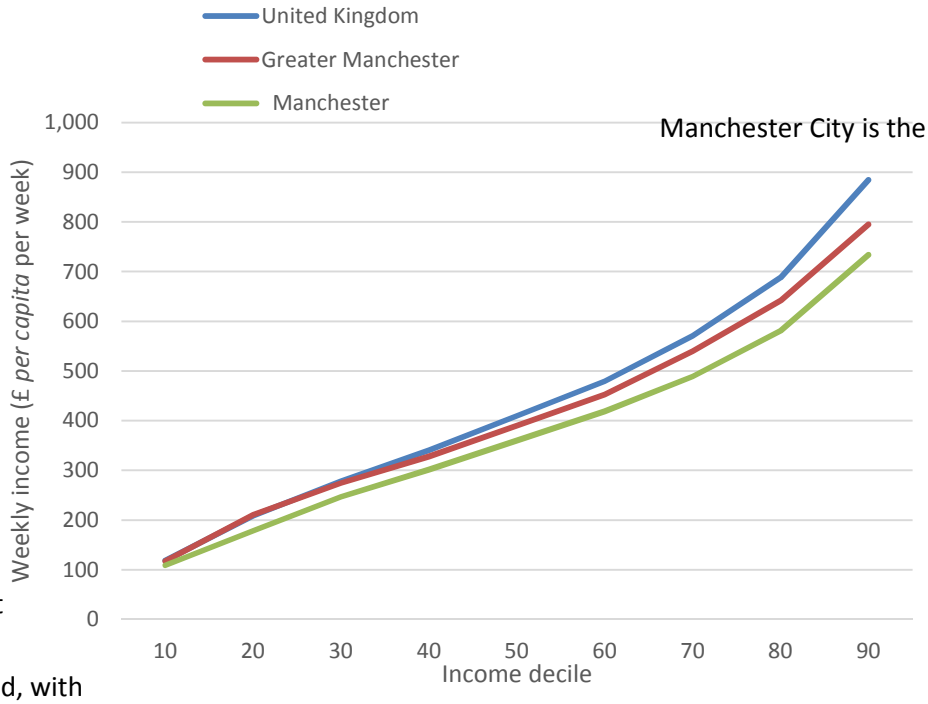

Figure 1: Comparison between the average weekly income in the City of Manchester, Greater Manchester and the UK

Manchester City is the 4th most deprived district in England, with 45% of the population living in areas that are in the 10% most deprived in the country[9]. With the average UK person's diet costing around £2,250 per year excluding alcoholic drink, (£6.20 per day)[10] food makes up a high proportion of many people's expenditure, and in parts of Manchester, evidence from our interviews suggests that a high proportion of this is on poor quality, highly processed foods, including takeaways. Figure 1 shows weekly incomes in Manchester to be lower than the average for both Greater Manchester and the UK. Food poverty is thought to be an increasing issue across the city.

4.3 Fresh food supply and demand

Some deprived areas have poor access to fresh fruit and vegetables and have been referred to as 'urban food deserts'. For example, Wythenshawe, with a population of 80,000, is served by only two supermarkets. Many of the retail parades, originally dominated by grocery stores, are now occupied predominantly by fast-food outlets, with very few stores selling fresh produce. Manchester Poverty Commission's recommendations on food include a 'co-ordinated and sustainable approach to tackling food poverty' and 'increased access to affordable fruit and vegetables'[11] However, poor supply has resulted from poor demand, and there is some evidence that addressing food deserts

9 Manchester City Council, 2011. Indices of Multiple Deprivation 2010: Analysis for Manchester (v1.2).

10 Defra, 2013, Food Statistics Pocket Book. Our figure includes bought food and catering but not alcoholic drink. The average includes all ages.

11 Greater Manchester Poverty Commission, 2013. Recommendations Report.

alone does not substantially increase fruit and vegetable intake[12]. Complementary interventions are required to boost demand. Perceptions about the high cost of fresh food, combined with a lack of knowledge about how to prepare healthy, affordable meals from basic fresh ingredients, and lack of kitchen appliances in the home can all contribute to poor diet.

4.4 Health

Modelling carried out by Public Health Manchester, using data from a locally conducted lifestyles survey, suggests that almost half the adult population (46%) is overweight and 19% are obese[13]. The same survey found that 70% are eating less than five portions of fruit and vegetables a day. Coronary Vascular Disease is the biggest killer in Manchester, accounting for about 30% of deaths in 2010 (significantly higher than the average across England). This rate is falling, though at a slower rate than for England as a whole[14]. It is therefore clear that in the more deprived areas, improving diet is a greater priority than food provenance.

Deprived areas are the focus for many of Manchester's sustainable food initiatives, with emphasis in these areas being on improving diets through growing, preparing and cooking food. Many of these are community-based initiatives, of which Real Food Wythenshawe is the most prominent.

4.5 Greenhouse gas emissions

The greenhouse gas footprint of the average UK diet has been estimated at 8.8 kg CO_2e per day, or 3.2 tonnes CO_2e per annum[15], and our best estimate of this figure for Manchester, adjusted to take account of Manchester's income profile[16], is very slightly lower at 3.1 tonnes CO_2e per annum.

Meat and meat products account for 46% of the greenhouse gas footprint (up to the point of sale) of the average UK diet. However they only contribute to 17% of the calories and 38% of the protein, the total level of which is well in excess of the recommended daily allowance-RDA (see Figure 2, below). A high meat diet is therefore inefficient in terms of greenhouse gas emissions.

12 Pearson, Russell, Campbell and Barke, 2005. Do food deserts influence fruit and vegetable consumption? Appetite. 45(2) pp.195-197.
13 Cox, C., 2013. Public Health Manchester (Food Futures). Personal communication.
14 Manchester City Council, 2013. Joint Strategic Needs Assessment: Heart Desease (CVD)
15 Hoolohan, C., Berners-Lee, M., McKinstry-West, J. and Hewitt, C. (in press) Mitigating the greenhouse gas emissions embodied in food through realistic consumer choices. Energy Policy.
16 Based on 2010 data from the Office of National Statistics Annual Survey of Hours & Earnings (ASHE), http://www.statistics.gov.uk/pdfdir/ashe1210.pdf

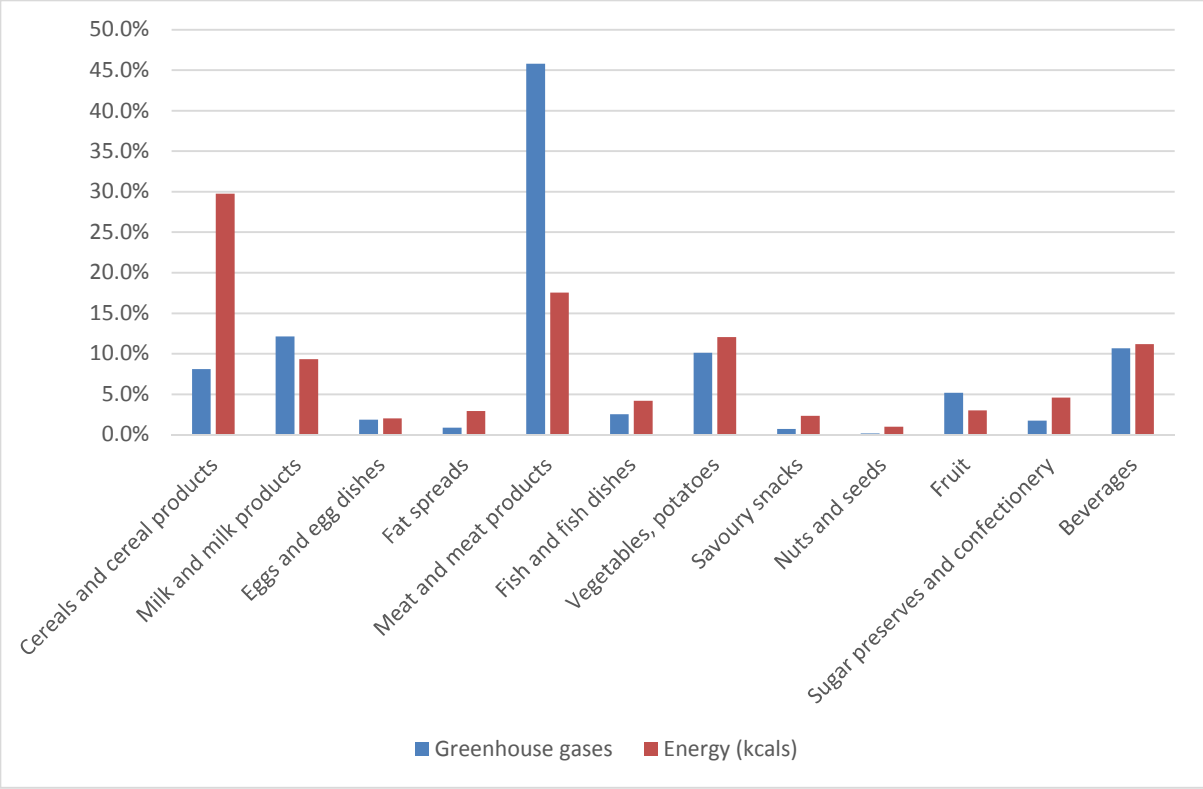

Figure 2: GHG emissions and calories in the average UK diet[17]

4.6 Scale and vulnerability of sustainable food schemes

There is already a wide range of sustainable food initiatives in Manchester. Schemes are often run by well informed and passionate people, many of whom are volunteers. Community involvement is an underlying principle. There also appears to be an encouraging willingness from many of these schemes to share knowledge and support other start-up enterprises and to offer training and education.

Sustainable food initiatives tend to be built on grant-funded social enterprise schemes, community-led initiatives, or co-operatives. Some of these are self-financing. Unicorn Grocery in Chorlton is a prominent example. With a turnover in excess of £5 million, this is equivalent to around £10 of spend per year per Manchester resident or a little under half a per cent of Manchester's food being supplied through its sustainable supply chains[18]. However many schemes rely on insecure funding streams, despite the volunteers helping to sustain them. This is particularly problematic since the benefits of such schemes usually take several years to gain their full momentum.

[17] Taken from the analysis lying behind Hoolohan, C., Berners-Lee, M., McKinstry-West, J. and Hewitt, C. (in press) Mitigating the greenhouse gas emissions embodied in food through realistic consumer choices. Energy Policy. The chart itself was not published.

[18] Not all of Unicorn's sales are to Manchester residents although their customer survey shows 81% of sales being to people living within five miles of the store.

Whilst they provide leadership and a healthy start point, between them all these schemes currently only account for a barely significant proportion of Manchester's total food system.

Appendix 4 contains a series of case studies, and project overviews.

4.7 Community food growing and gardening initiatives (Grow-your-own)

We estimate that at least 21,220 Manchester residents participate in, or are targeted by, existing community growing schemes listed by the Federation of City Farms and Community Gardens and other sources. Between them the schemes reach across all sections of society. There are also over 2,300 allotment plots that provide further 'grow-your-own' opportunities. (See Appendix 4 for a list of community gardens and allotments in Manchester. Note that it has not been possible to get a comprehensive list of community growing sites, but this provides an indication of the scale of these kinds of initiatives). If four people were to benefit from each allotment or community garden 'plot', around 6% of Manchester's population could be benefitting from the existing grow-your-own provision. All private gardens are in addition to this.

Growing Manchester, a Food Futures Partnership initiative, is designed to engage the community in food growing schemes (further details in the case study presented within Appendix 4), and has had considerable success in this respect.

4.8 Waste

It has been estimated that 30-50% of food produced globally is wasted[19]. Most of this is generated either at source (i.e. on the farm) or by the consumer, with the latter being most relevant for Manchester given that farming within Manchester city produces only a very small proportion of the food that it consumes. Avoidable post-purchase waste in the UK is estimated to represent approximately 12% of all food purchased[20] and the figure for Manchester is likely to be similar. Supermarket waste is much lower but also significant at around 1% of checkout sales[21]. Manufacturing food waste is somewhat higher than that of retail.

There are schemes in Manchester aimed at redistributing and recycling discarded food from the food production and wholesale sector which would otherwise end up as waste. FareShare North West (see case study), based at New Smithfield Market (NSM), has been set up to address food poverty and acts as a storage and distribution hub for surplus food or food with damaged packaging (in-date edible products). This is donated to them by companies such as Greggs, Brakes, Gerber, Robert Wiseman, Nestlé, and Kelloggs. Since 2011 they have also been capturing fresh fruit and vegetables which would have gone to waste, from traders on NSM. Some of this food comes via Fairfield Materials Management (FMM). Between July and October 2013 32 tonnes of fresh food from NSM was captured and a further 16 tonnes gleaned from farms by volunteers. The gleaned food would have been ploughed back into the land had it not been captured by FareShare North West.

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19 Institution of Mechanical Engineers, 2013. Global Food: Waste not, want not.
See also Food and Agriculture Organisation of the United Nations, 2011, Global Food Losses and Food Waste, which states "Roughly one third of food produced for human consumption is lost or wasted globally"

20 Quested, T., and Parry, A., 2011. New Estimates for Household Food and Drink Waste in the UK.

21 Based on data and discussions with Booths supermarkets. WRAP 2010 estimated food retail waste slightly higher and the difference may reflect real improvement on the ground.

FMM is a sustainable waste management recycling organisation, run as a social enterprise, which also operates on site at New Smithfield Market. It recycles the fruit and vegetable waste produced on site that is collected by MCC from the wholesale traders. Over the last 12 months (November 2012 to October 2013) FMM has handled 2,511 tonnes of this waste of which 2,357 tonnes (94%) was sent for livestock feed and 154 tonnes (6%) was sent for composting. As mentioned above produce that is still edible is sorted and sent by Fairfield to FareShare North West. Between 10 and 30% of the food Fairfield receive could be redistributed by FareShare North West. The fruit and vegetables sent for compost are composted by their composting partner. Over the same period they have brought back and sold 806 tonnes of compost. Fairfield has a turnover of around £300,000, has 6 full-time employees and currently has 5 volunteers working with them.

Both FareShare and Fairfield offer work experience for local people and the former also offers training and development opportunities. Social enterprise food waste schemes can be dependent on volunteers for their success. This can make them potentially vulnerable as well as only offering limited opportunities for paid employment.

There are currently plans underway to build an Anaerobic Digestion Plant on site at New Smithfield Market. If this took all the waste from the market traders it would impact directly on both the above organisations.

4.9 Emphasis on organic

Many of the sustainable food initiatives in Manchester are strongly committed to organic principles. Whilst Manchester's aspirational middle class areas provide a market, the findings of our interviews suggest that in the poorer parts of the city organic food is widely seen as a middle class indulgence and the perceived (and usually real) price premium puts it out of reach. The level of attention that should be given to organic principles in the face of immediate food poverty has proved contentious and at times divisive among those concerned with sustainable food in Manchester.

4.10 Capacity for local food production

In terms of access to locally-produced food, Greater Manchester has been ranked 59th out of 61 counties[22].

Table 1 summarises our analysis[23] of the land and populations in Manchester City, Greater Manchester, the wider region (within a 50 mile radius – as shown by Figure 3) and the UK. The UK currently produces around 60% of its own food and has a population density of 2.6 people per hectare[24]. Manchester has 17 times the population density of the UK and just 3% of the green space per person. Greater Manchester, meanwhile, has eight times the UK's population density and 10%

[22] (Ricketts Hein et al, 2006. Distribution of Local Food Activity in England and Wales: An Index of Food Relocalisation, Regional Studies, Vol 40.3 Journal of Rural Studies,)

[23] Based on statistics derived from the General Land Use Database a generous estimate of the hypothetical 'vegetated' land area available for cultivation was made using *Domestic Gardens* and *Greenspace* land areas. We made a best-case scenario assumption that 100% of this land would be fully cultivatable and would produce similar yields to food grown under standard, large-scale practises. These are very generous assumptions and it is likely that the yield would be significantly lower. By aligning this theoretical land area with basic land requirements for food suggested by Gerbens-Leenes *et al.* (2002) we established a percentage of the population in the area that could potentially be fed.

[24] Defra, 2008. Ensuring the UK's food security in a changing world.

of the green space per person that the UK enjoys[25]. Furthermore, much urban green space cannot realistically be used for food production, except under emergency conditions. Based on current diets and waste levels, it is therefore difficult to imagine Manchester growing more than around 1% of its own food[26]. Greater Manchester has somewhat more potential, and may be realistically capable of producing around 3% of its own food. However if the definition of local is extended to a 50 mile radius around Manchester, it is not unreasonable to think that, in principal at least, it might be possible to source all food 'locally', although this would also require accompanying dietary change and waste reduction.

The scarcity of land dictates that Manchester City's agriculture industry does not provide high potential for jobs or GVA (currently just £4.2 million; 0.03% of Manchester's GVA[27]).

Table 1: Land and population comparisons

	Manchester	Greater Manchester	50 mile radius	UK
Total land area (km^2)	116	1,280	14,697	243,610
Vegetated land (%)	55%	75%	90%	95%*
Total population (N°)	502,900	2,685,400	5,884,127	63,705,000
Vegetated land per person (m^2)	126	358	2,247	3,633
Vegetated land per person as a proportion of the UK's vegetated land per person[28]	3%	10%	62%	100%

*Estimated

[25] Based on statistics derived from the General Land Use Database, http://data.gov.uk/dataset/land_use_statistics_generalised_land_use_database

[26] This is estimated as follows: Proportion of food that can be grown in Manchester = Proportion of UK's food grown in UK (60%) x greenspace per person compared to UK (3%) x notional mark down to take account of unusable urban greenspace (0.5).

[27] Greater Manchester Forecast Model District Data (New Economy Manchester), http://neweconomymanchester.com/stories/1119-greater_manchester_forecasting_model

[28] This is calculated by dividing the amount of vegetated land per person in Manchester, Greater Manchester and the region within 50miles, respectively, by the amount of vegetated land per person in the UK. This gives a percentage

Figure 3: The area within 50 miles of Manchester

4.11 Joining up the effort

Feeding Manchester[29] provides a valuable forum for numerous small-scale initiatives operating successfully to meet, share expertise and co-ordinate their activities. Food Futures, a partnership coordinated by the City Council, and attended by participants from the public sector, social housing organisations and others, has a remit to support sustainable food initiatives, but only a limited resource with which to do so. Among its activities are regular forums and a bulletin, the production of the Food Futures Strategy and initiatives such as Growing Manchester. These link into the wider public health agenda. There are often differences of view as to the priorities within the sustainable food agenda. In particular there are often conflicting views over the importance of organic food.

[29] http://www.feedingmanchester.org.uk/

5. Core criteria

Sustainability means different things to different people, and it will not be possible to achieve a single definition which everyone considers to be ideal. For the purpose of this work, we have adopted, in agreement with Manchester City Council, a set of six criteria for sustainable food in Manchester that are designed to mesh with existing policy making criteria, and to be simple enough to work with. They have been designed to span the whole of the sustainability agenda (including environmental, social and economic dimensions) over which food has impact. They align strongly with those established earlier this year, also in consultation with Manchester City Council when developing policy options for climate change mitigation[30]. GVA and Jobs has been specifically included in recognition of its importance in Manchester policy decision making.

We have avoided including particular food practices within the criteria themselves, since the complex ways in which different practices link to the criteria is explored in the next sections.

The six core criteria are:

- **Environment**: especially climate change mitigation, but also land quality improvement, biodiversity, reducing other environmental burdens and managing fish stocks.
- **Health**: both mental and physical.
- **Building social capital**.
- **Mitigating the impacts of austerity on the most vulnerable**. While in this report we focus on improving the economic wellbeing of those in Manchester's most deprived districts, we also recognise the great importance of extending this to workers throughout the global supply chain, and acknowledge that value of Manchester's status as a Fair Trade City.
- **Food security**.
- **GVA & Jobs**.

[30] Our criteria reflect those used in our recent report "The Economic and Social Benefits of Reducing Greater Manchester's Total Carbon Footprint", February 2013, developed with Warren Hatter of Ripple PRD and in consultation with Manchester City Council policy makers.

6. Key food practices

We identified a list of key food practices within Manchester that might be best able to bring about the six core sustainable food criteria that are outlined above. We have kept the list short, conscious of a trade-off between usability and completeness. This list largely includes the practices contained in Food Futures' existing definition of sustainable food[31]. In the next section we explore the extent to which each practice can influence the criteria in Manchester.

6.1 Sustainable sourcing

Within this we have specifically looked at the benefits of:

- **local production and sourcing**, considering the relative opportunities and benefits of different degrees of localisation;
    - within Manchester City;
    - within Greater Manchester;
    - within 50 miles of Greater Manchester;
    - within the UK.
- **grow-your-own**, including community projects, allotments and private gardens;
- **organic;**
- **seasonal /no air freight;**
- **Fair Trade & sustainable fish stocks** (whilst noting that their benefits do not directly affect Manchester's residents).

6.2 Waste reduction

We break this category down into the core stages of the supply chain:

- farm waste;
- distribution and retail waste;
- consumer waste; and
- catering waste.

Note that each category refers to activities taking place within the geographic limits used in this report (e.g. Manchester City, Greater Manchester, a region within 50 miles or the UK). It does not refer to activities taking place elsewhere (for example, farm waste does not include that generated in other places, since it is not within Manchester City Council's sustainable food remit to deal with that. Likewise, consumer waste refers only to waste generated by Manchester's consumers).

6.3 Sustainable diets

We have distilled the enormous complexity of dietary choice into the following simple dietary options:

- less meat;
- shifting the type of meat to less greenhouse gas-intensive choices;

[31] As outlined in Scoping the baseline of sustainable food consumption and production, Debbie Ellen, 2010, and detailed in Appendix 1 of that report. We have not covered animal welfare. Health and wellbeing are covered within the criteria rather than specific practices.

- more fruit and vegetables;
- more cereals, grain and bread;
- less dairy; and
- less salt, sugar and fat.

6.4 Minimising packaging

While packaging is often useful in protecting food from damage (and therefore in reducing food waste), we explore the importance of eliminating *unnecessary* packaging from the food chain.

7. The extent to which practices enable the core criteria

In this section we explore the extent to which the different food practices can enable each of the core criteria that we have identified. The linkage is often complex and sometimes contentious. Some readers will inevitably find that some of our findings challenge long held assumptions or views. Our intention is to enable well targeted policy making, based on well-founded understanding of which practices can best bring about which benefits.

The table below gives an 'at a glance' view, summarising the discussion that follows it, by ranking each practice for its potential to impact on each of the criteria (lighter shades representing actions that have the lowest potential impact and darker shades the highest). The construction of this matrix was inevitably a reductionist exercise, involving simplifications, the use of best available research data and judgements. We present it as a crude, imperfect map of the extent to which each practice stands to have a bearing on the different aspects of the sustainable food agenda. We propose this as a working model; for use now, but with scope for further refinement.

	Practices	Environment	Health	Mitigating the impacts of austerity on the most vulnerable	Building Social Capital	UK Food Security	Manchester GVA & Jobs	Notes
Sustainable Production and Sourcing	Local - within Manchester							Low growing potential within Manchester.
	Local - within Greater Manchester							
	Local - within 50 miles							
	Local – UK							
	Grow-your-own							Environmental benefit is indirect through attitude change. Jobs through improved employability.
	Organic							Food security through land improvement.
	Seasonal and without air freight							
	Fair Trade							No impacts within Manchester but very important for poverty relief and building social capital worldwide.
Waste Reduction	Farm waste							Includes only Manchester farming
	Distribution & Retail waste							
	Consumer waste							Assumes poorer people incur average UK food waste.
	Catering waste							
Sustainable Diets	Less meat							
	Lower carbon meats							Shift from beef and lamb to chicken, etc.
	More fruit and veg.							Some double counting. We assume these actions bring about meat reduction.
	More cereals, grains and pulses							
	Less dairy							
	Less sugar salt and fat							
	Packaging reduction							

7.1 Local sourcing

The environmental benefits of local food production come primarily from savings in transport emissions. While there are limited opportunities for very local sourcing in Manchester, obtaining more food from the region and from the UK is a realistic long-term action for Greater Manchester, and since transport accounts for around 8% of the greenhouse gas footprint of our food there is a significant environmental case for doing so[32]. The majority of the transport savings can be achieved through UK sourcing and the greenhouse gas benefit of very local sourcing compared to produce from 50 miles away is slight. Note that where local production entails the use of artificial heat, environmental benefits are generally negated, unless the source of heat is also renewably sourced[33]. Therefore, since the UK does not have the climate for all crops, many commonly used foods and drinks (e.g. tea, coffee, bananas, rice, etc.) will probably always need to be imported unless dropped from the menu. Furthermore there are some significant uncertainties relating to crop yields, energy requirements (e.g. for artificial heating) and food security, which mean that retaining a balance of imports and exports may be desirable[34].

The potential impact of climate change on food supply chains, and therefore food security, is complex and uncertain. While the UK's climate may become more favourable for food production, there is little doubt that climate change will have a severe impact on food production globally, with many of the countries we currently rely on for food being increasingly affected by droughts and wildfires. As events of this nature become more common, more countries are likely to adopt a protectionist response (e.g. Russia's 2010 grain export ban)[35]. Global trade in food may be severely disrupted, though this may equally mean that the UK's food would similarly be protected for UK use. Given Manchester's limited local growing capacity, there is little scope for improving food security or sovereignty by increasing production within the City, although by widening the area out to the region or to the UK, this becomes worthwhile and important.

The limited availability of land means that the agricultural industry offers only limited scope for GVA and jobs, relative to other parts of the UK, although this may be maximised by increasing the long term productivity of land as well as the market value of produce through adoption of organic principles.

7.2 Grow-your-own

The direct environmental benefits of grow-your-own initiatives are marginal, given the very limited scope for production in this way compared to the overall food requirement. There may, however, be significant indirect benefits resulting from attitudinal change associated with closer contact with the land; while it is difficult to ascertain the change in pro-environmental attitudes as a particular outcome of the project, the findings of the Growing Manchester initiative suggest the potential for

32 Based on Booths Supermarkets: 'The Greenhouse Gas Footprint of Booths Supermarkets', Small World Consulting Ltd 2012, available at www.booths.co.uk

33 Williams, A.G., Audsley, E., and Sandars, D.L., 2006. Determining the Environmental Burdens and Resource Use in the Production of Agricultural and Horticultural Commodities.

34 Cowell, S., and Parkinson, S., 2003. Localization of UK Food Production: An analysis using land area and energy as indicators. *Agriculture, Ecosystems, and Environment*, 94: 221-236.

35 Defra, 2012. UK Climate Change Risk Assessment 2012.

sustainability issues to be further emphasised and well-received in future rounds of the programme[36]).

In terms of quantifying the direct contribution of grow-your-own, the 2008 UK Family Food Survey found that 3% of fruit and vegetables entering households came from gardens and allotments[37]. Meanwhile, fruit and vegetables account for around 10% of the greenhouse gas emissions behind UK food and 15% of the cost[38]. Therefore, in the very unlikely event of an urban area such as Manchester increasing the proportion of home-grown fruit and vegetables to 10% (over three times the national average), this would still only save around 1% of the greenhouse gas footprint of food and 1.5% of the cost. Although modest, the cost savings, if concentrated on poorer households, could still contribute somewhat to relieving poverty.

Grow-your-own projects can do relatively little directly to increase GVA and jobs (though there could be some improvement to employability), and given their small scale, little to improve food security.

The principal benefits of home and community grown food initiatives, however, appear to be associated with improved health, wellbeing and social capital. Epidemiological evidence suggests a positive relationship between green space in the living environment and physical and mental health, cognitive function and longevity[39]. The activity of gardening itself, particularly communal gardening, is associated with a host of benefits to wellbeing, including physical health, stress relief and social capital[40]. There is also evidence that participation in a community gardening group increases fruit and vegetable intake by more than the amount which is grown; surveys in Michigan, USA, found that adults with a household member who participated in a community garden scheme consumed fruit and vegetables 1.4 more times per day than those who did not, and they were 3.5 times more likely to consume fruit and vegetables at least 5 times daily[41]. Indirect economic benefits almost certainly result from improved health and wellbeing.

In addition to benefits across the general population, studies highlight particular benefits to certain groups of people; for example, community allotments or gardens can help the elderly to continue gardening by providing the support necessary to overcome age-related physical limitations, thereby

36 Kazmierczak, A., Connelly, A., and Sherriff, G. 2013. *Growing Manchester* Programme: Final Evaluation Report.

37 DEFRA, 2010. Family Food 2008: A report on the 2008 Family Food Module of the Living Costs and Food Survey.

38 Based on research for Booths Supermarkets:, Small World Consulting Ltd. 2012 'The Greenhouse Gas Footprint of Booths Supermarkets' http//: www.booths.co.uk

39 Keniger, Gaston, Irvine, and Fuller, 2013. What are the benefits of interacting with nature? Int J Environ Res Public Health. 10 (3), 913–935.

40 Keniger, Gaston, Irvine, and Fuller, 2013. What are the benefits of interacting with nature? Int J Environ Res Public Health. 10 (3), 913–935;
Van den Berg, and Custers, 2011 Gardening promotes neuroendocrine and affective restoration from stress. J. Health Psycol. 16, 3-11;
Firth, Maye and Pearson, 2011 Developing "community" in community gardens, Local Environment: The International Journal of Justice and Sustainability,16:6, 555-568.

41 Alaimo, K., Packnett, E., Miles, R., and Kruger, D., 2008. Fruit and vegetable intake among urban community gardeners. J Nutr Educ Behav.; 40(2):94-101.

improving health and overcoming social isolation[42]. The wellbeing benefits of gardening have also been capitalised upon by numerous schemes dedicated to users of mental health services[43]. Mediated gardening projects by local health services can maximise the therapeutic benefits of gardening to users, providing improved wellbeing and an important social network[44]. In Scotland, 'Peebles Can' actively targets unemployed young people, providing them with skills training in horticulture and catering, and cultivating a positive work ethic[45].

Results from case-study work show how community gardens help build cohesion and vitality in a community, contributing to bonding, bridging and linking social capital[46]. The nature of this social capital depends on whether the community garden is "place-based" or "interest-based". The former are more territorially embedded in the local community, while the latter may span across diverse communities, with the social capital generated remaining within an "interest community". These categories may not always map neatly on to one community garden, although one category may be more immediately evident.

Evidence from the Growing Manchester evaluation report[47] supports many of the findings from elsewhere, detailed above. Among the benefits of this initiative were found to include increased fruit and vegetable uptake (including a willingness to try new types), improved food growing skills, greater engagement in physical activity (with some participants having lost weight), greater community connection and socialisation and increased calmness and sense of achievement. Interestingly, participants who took the least exercise and ate the fewest fruit and vegetables learned more about the wellbeing benefits of growing than those who already engaged in these behaviours, suggesting that this could result in a change of lifestyle among those people and increase the frequency of healthy behaviour.

The longevity of grow-your-own initiatives is critically important in securing the associated social inclusion and community benefits, because these take time to develop. Risks to longevity include lack of enduring funding and the difficulties associated with engaging volunteers. Setting up secure long-term funding streams, where funders and the gardens' agendas are well matched, and recognising the value of volunteers can reduce the risk of community gardens becoming inactive

42 Milligan, Gatrell and Bingley, 2004. Cultivating health: therapeutic landscapes and older people in northern England Social Science & Medicine, 58 (9), 1781–1793
Van den Berg, Van Winsum-Westra, de Vries, and van Dillen, 2010. Allotment gardening and health: a comparative survey among allotment gardeners and their neighbours without an allotment. Environmental Health, 9:74.
43 Fieldhouse, 2003 The Impact of an Allotment Group on Mental Health Clients' Health, Wellbeing and Social Networking The British Journal of Occupational Therapy, 55 (7), pp. 286-296.
44 Parkinson, Lowe, and Vecsey. 2011 The therapeutic benefits of horticulture in a mental health service. The British Journal of Occupational Therapy, 74, (11), pp. 525-534.
45 'Peebles Can', 2001. Retrieved September 04, 2013, from http://peeblescan.org/
46 Firth, Maye and Pearson. 2011. Developing "community" in community gardens, Local Environment: The International Journal of Justice and Sustainability, 16:6, 555-568.
47 Kazmierczak, A., Connelly, A., and Sherriff, G. 2013. *Growing Manchester* Programme: Final Evaluation Report.

over time, and ensure the benefits are sustained[48]. Experience from around the UK suggests that it is not usually realistic for these schemes to become self-financing[49].

Increased health and wellbeing also has economic benefits, in reducing healthcare costs and increasing productivity at work.

7.3 Organic production and consumption

The question of whether, and to what extent, organically produced food is preferable to conventional food is important and is emotive within Manchester. The answer depends partly up on which of the sustainability criteria are most valued.

Organic food has undisputed environmental benefits. It can support climate resilience by preserving the soil's ability to regulate and retain water[50]. This is especially important given the projected increase in extreme weather events, including droughts, due to climate change. Gomiero *et al.* (2011) suggest that "adaptive measures to cope with climate change should treasure knowledge gained from organic farming"[51]. Organic production is also less energy-intensive and is therefore associated with lower greenhouse gas emissions, largely due to the energy-intensive nature of the production of nitrogen fertiliser used in non-organic methods[52]. Furthermore, organically-managed soils have greater capacity to store CO_2, increasing storage annually until reaching a stable level of sequestration[53]. This is important given that soils represent the world's second largest carbon sink after the oceans. The Soil Association claims that if organic farming were common practice in the UK, we could offset at least 23% of agriculture's current greenhouse gas emissions[54]. Arguably the principal environmental benefit of organic production is its ability to support soil functioning and protection of biodiversity[55], both are critical to long-term food production, and therefore essential to sustaining all life.

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48 Pearson and Firth, 2012. Diversity in community gardens: Evidence from one region in the United Kingdom. Biological Agriculture & Horticulture: An International Journal for Sustainable Production Systems. 28:3, 147-155, DOI: 10.1080/01448765.2012.706400

49 Mc Glone, Dobson, Dowler and Nelson, 1999. 'Food Projects and How the Work' A report by the Joseph Rowntree Foundation

50 de Vries and Bloem, et al., 2012. 'Extensive Management Promotes Plant and Microbial Nitrogen Retention in Temperate Grassland'. PLoS ONE 7(12): e51201.

51 Gomiero and Pimentel, et al., 2011. .Environmental Impact of Different Agricultural Management Practices: Conventional vs. Organic Agriculture'. Critical Reviews in Plant Sciences 30(1-2): 95-124.

52 Maeder and Fliessbach et al.. 2002. .Soil Fertility and Biodiversity in Organic Farming'. Science 296(5573): 1694-1697.
Tuomisto and Hodge et al., 2012. 'Does organic farming reduce environmental impacts? – A meta-analysis of European research." Journal of Environmental Management 112(0): 309-320.
Gomiero and Pimentel et al. 2011. 'Environmental Impact of Different Agricultural Management Practices: Conventional vs. Organic Agriculture.' Critical Reviews in Plant Sciences 30(1-2): 95-124.

53 Gomiero and Pimentel et al., 2011. 'Environmental Impact of Different Agricultural Management Practices: Conventional vs. Organic Agriculture.' Critical Reviews in Plant Sciences 30(1-2): 95-124.

54 Azeez, G., 2009. Soil Carbon and Organic Farming.

55 Maeder and Fliessbach et al., 2002. 'Soil Fertility and Biodiversity in Organic Farming'. Science 296(5573): 1694-1697.
Thiele-Bruhn and Bloem et al.. 2012. 'Linking soil biodiversity and agricultural soil management'. Current Opinion in Environmental Sustainability 4(5): 523-528.

Many studies show that yields produced using organic methods are lower than those produced conventionally[56], and that organic farming is therefore not currently a realistic approach for generating adequate food supplies. While this may be true in the short-term, the long term picture is very different since soil degradation through over-use of agro-chemicals and frequent tilling (practices used in conventional farming), together with the threat of both climate change and phosphorous depletion (some researchers claim that phosphorous reserves could be fully depleted within 50-100 years[57]) is likely to impact significantly on future yields. Furthermore, much of the soil degradation associated with present day conventional farming may be irreversible. Taking a longer term view of the food capacity of Manchester's land, the principles of organic farming look to be important. Moreover, lower yields could be off-set to some degree by a more systemic approach where significantly reducing food waste removes the need for some food production, and hence the need for such intensive farming practices.

Comparing the relative health benefits of conventional and organic farming methods is challenging, largely because studies tend not to have the very long timeframes needed to consider the impact of long-term consumption of products intensively farmed using agro-chemicals. Some studies suggest that organic fruit and vegetables can have higher vitamin C levels, for instance, though the main argument in favour of organic is the reduced consumption of agro-chemicals[58]. Nevertheless, the link between organic food and health outcomes appears inconclusive[59], particularly given the limitations of the studies carried out to date. The case for promoting organic food in Manchester on the basis of health outcomes alone is therefore not strong, particularly wherever cost is important.

It is probably not always helpful to polarise all food into one of two categories; conventional and organic, but rather to think in terms of a continuum which also acknowledges the benefit movement towards organic principles.

It should be noted that, though the topic of Genetically Modified (GM) foods would naturally fall within this section, we have not discussed it, principally because GM for human consumption is currently prohibited in the UK (though not for animal feed). Should this situation change, Manchester City Council may wish to revisit this issue.

7.4 Seasonal and no air freight

The principal benefits of increasing the proportion of seasonal, non-air freighted food are associated with a reduction in emissions from transport and energy-intensive hot-housing. Promoting a 'global seasonal' model for food procurement means eliminating these, as far as possible. Under this model, asparagus, for example, would only be available for the relatively short British season, while cherries would be sourced only from Europe so that they can be shipped rather than air-freighted. Tomatoes would be grown during the UK season, and otherwise shipped from the Mediterranean, with a short

56 Williams and Audsley, 2008. Comparative life-cycle assessment of food commodities procured for UK consumption through a diversity of supply chains.

57 Cordell, Drangert, and White, 2009. 'The story of phosphorus: Global food security and food for thought'. Global Environmental Change 19 (2): 292–305.

58 Huber and Rembiałkowska et al., 2011. 'Organic food and impact on human health: Assessing the status quo and prospects of research'. NJAS - Wageningen Journal of Life Sciences 58(3–4): 103-109.

59 Smith-Spangler and Brandeau et al., 2012. 'Are Organic Foods Safer or Healthier Than Conventional Alternatives? A Systematic Review'. Annals of Internal Medicine 157(5): 348-366.

spell of unavailability during winter[60]. Oranges and bananas could still be imported by boat throughout the year, as could apples, outside the UK season.

Such actions could deliver greenhouse gas savings of at least 5% on the footprint of UK food consumption[61]. Based on these conservative figures, the 'global seasonal' model could offer greenhouse gas savings of 87,000 tonnes CO_2e per year across the population of Manchester, and there is therefore a reasonable environmental case for pursuing this action.

The 'global seasonal' model could additionally offer some modest benefits in terms of increased food security and some increase in jobs and GVA (particularly if we consider production in Greater Manchester and regionally). Since hot-housing and air-freighting are expensive practices, adding to the price of food this action also stands to help mitigate the impact of austerity on Manchester's most vulnerable people.

7.5 Fair Trade and sustainable fish supplies

These principles are undoubtedly important elements of a global sustainable food system. Whilst they produce no direct material benefits to Manchester's residents they both meet moral responsibilities and stand to benefit residents indirectly by contributing to a sense of a city that cares. Manchester is already a Fair Trade City.

7.6 Waste reduction

Waste reduction brings proportional reductions in environmental impacts and food costs, and a proportionate improvement in food security. At face value at least, it offers one of the simplest routes to significant sustainability improvements.

We estimate that the elimination of the 12% avoidable post-purchase waste within Manchester would save 187,000 tonnes CO_2e per year[62]. While schemes to generate energy, compost or animal feed from waste food are preferable to landfill, it is important to recognise that these are still very inefficient uses of food and the benefits are marginal compared to solutions that lead to the food being eaten by people. All food that is not eaten by humans is therefore best thought of as waste.

There is also some scope for building social capital and alleviating joblessness through food waste reduction schemes.

7.7 Dietary change

The adoption of sustainable diets offers some of the greatest potential for environmental benefit. The greenhouse gas emission savings attainable by switching to a vegetarian diet simply by substituting the calories obtained from meat in the average UK diet with realistic alternatives, have

60 Williams and Audsley, 2008. 'Comparative life-cycle assessment of food commodities procured for UK consumption through a diversity of supply chains'.

61 This is a conservative estimate based on data from a supermarket chain (Booths) that is already working actively to reduce air-freighting in its supply chain. Savings across Manchester could be significantly greater. Data taken from Hoolohan, Berners-Lee, McKinstry-West and Hewitt (in press) 'Mitigating the greenhouse gas emissions embodied in food through realistic consumer choices'. Energy Policy.

62 GHG Saving = Population x Food Footprint Per Person x Proportion of Food Wasted

been estimated at up to 35%, depending on the alternatives chosen[63]. Reducing meat consumption improves the efficiency of food production, substantially reducing the land requirement per person, and thereby improving food security. Even without reducing total meat consumption, switching consumption from greenhouse gas intensive meats (i.e. beef and lamb) to less intensive meats (i.e. chicken and, to a lesser extent, pork) across Manchester's population could result in emissions savings of approximately 18%[64]. Figure 4 illustrates the greenhouse gas hierarchy of meats[65].

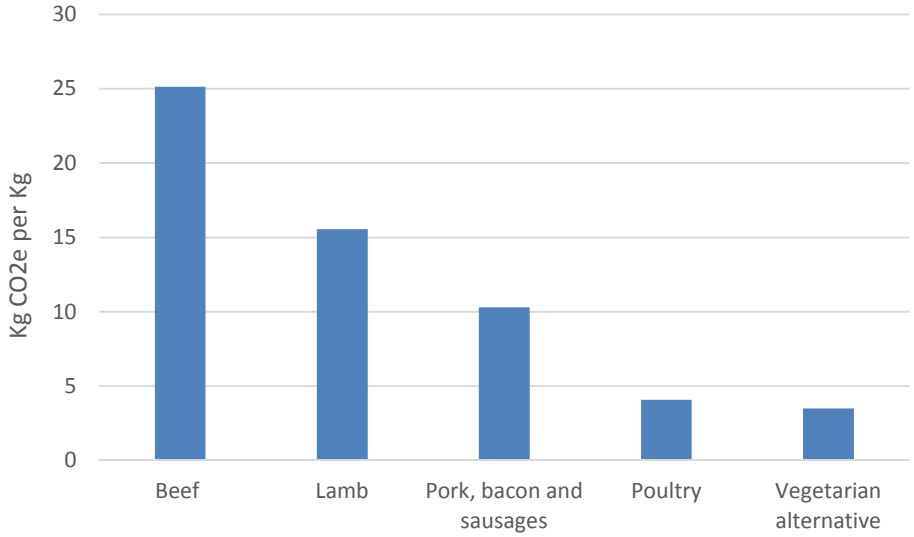

Figure 4: Greenhouse gas footprint of meats at the supermarket checkout

The environmental case for increasing fruit and vegetables in the average diet depends on seasonality and transport. Assuming, as seems reasonable, that increases avoid air freight and hot-housing, and that they replace a cross section of other foods, including meat and dairy, there will be a positive environmental benefit.

Perhaps the principal benefit of dietary change within Manchester is the potential for improved health. Diet-related ill-health has been found to be responsible for about 10% of morbidity and mortality in the UK (similar to that attributable to smoking), and costs the NHS about £6 billion per year[66]. If Manchester were typical of the UK, we would expect its pro rata share of these costs to be around £50 million per year. However, given that Greater Manchester has the UK's highest rates of cancers, strokes, heart disease and suicides, given the very high incidence of deprived wards within

[63] Berners-Lee, Howard, Moss, Kaivanto and Scott, 2011. 'Greenhouse gas footprinting for small businesses – the use of input–output data' Science of Total Environment, 409 , pp. 883–891

[64] Hoolohan, Berners-Lee, McKinstry-West, and Hewitt. (in press) 'Mitigating the greenhouse gas emissions embodied in food through realistic consumer choices'. Energy Policy.
See also Berners-Lee, Hoolohan, Cammack, and Hewitt, 2012. 'The relative greenhouse gas impacts of realistic dietary choices'. Energy Policy 43, pp. 184-190.

[65] The Greenhouse Gas Footprint of Booths Supermarkets, 2012. Retrieved September 04, 2013, from www.booths.co.uk.

66 Rayner and Scarborough, 2005. 'The burden of food related ill health in the UK. Journal of Epidemiology and Community Health'. 59: 1054-1057;
Scarborough, Bhatnagar, Wickramsinghe, Allender, Foster, and Mayner, 2011. 'The economic burden of ill health due to diet, physical inactivity, smoking, alcohol and obesity in the UK: an update to 2006-07 NHS costs'.

Manchester city and given the strikingly low life expectancy in some of these, it is reasonable to think that Manchester's share of the £6 billion could be several times higher than its pro rata share.

While improved health may not directly increase jobs or GVA, there are clear indirect benefits in terms of improvement in workplace productivity and education. Poor diet is known to affect cognitive ability and behaviour in children and adolescents[67]. It has been shown that missing breakfast reduces mental performance in malnourished children, and that good dietary habits are the best way to ensure optimal mental performance[68]. Overall the economic case, both direct and indirect, for healthier diets is very strong and should justify substantial investment.

Although the triple requirements of an environmentally sustainable, healthy and affordable diet do not precisely coincide there is plenty of overlap and relatively little conflict between the three agendas. As a general rule, less meat, especially less red meat, simultaneously serves all three, as does increasing the proportion of the diet that comes from cereals, fruit &vegetables (provided expensive air freight is avoided and artificial heat minimised). Reduction of salt improves health without compromising environment or affordability. Reduction of fat can readily accompany reduction in meat and certainly need not be to the detriment of either environment or affordability.

The greatest conflict between the three agendas probably arises over the question of organic sourcing, where important environmental criteria compete against the affordability of healthy food. Organic food generally incurs a price premium in exchange for an environmental benefit. Given the low proportion of the UK's land currently devoted to organic principles, there is plenty of scope for growing the market within more affluent households. The organic cause may best be served by, for the time being, promoting organic food where it can best be afforded and concentrating on improving the dietary health of the most deprived.

7.8 Reducing packaging

The Greenhouse gas case for focusing on action to reduce packaging appears to be relatively weak. Whilst it has been estimated that eliminating packaging entirely would result in savings of approximately 3% on the greenhouse gas footprint of food, equating to 52,000 tonnes CO_2e per year across the population of Manchester, much of this packaging performs an essential function. Eliminating it entirely is neither practical nor desirable, because it would likely lead to higher levels of food waste in the supply chain[69]. Un-recycled plastic clearly presents an environmental burden beyond the greenhouse gas emissions, which could technically be overcome through the use of biodegradable alternatives.

Minimising packaging will not impact significantly on the other sustainability criteria.

67 Bellisle, 2004. 'Effect of diet on behaviour and cognition in children'. British Journal of Nutrition 92(S2): S227-S232.

68 Bellisle, 2004. 'Effect of diet on behaviour and cognition in children'. British Journal of Nutrition 92(S2): S227-S232.

69 Hoolohan, Berners-Lee, McKinstry-West, and Hewitt, (in press) 'Mitigating the greenhouse gas emissions embodied in food through realistic consumer choices'. Energy Policy.

7.9 Summary of impact on GHG emissions from different food choices

Figure 5 summarises the potential emissions savings from simple consumer food scenarios[70]. The greatest savings are possible from changes in meat consumption. Waste reduction offers the greatest improvement without requiring dietary change. Elimination of air freight and hot-housing requires adoption of a seasonal diet supplemented with foods that can be shipped. The elimination of packaging is unrealistic and would result in increased food waste.

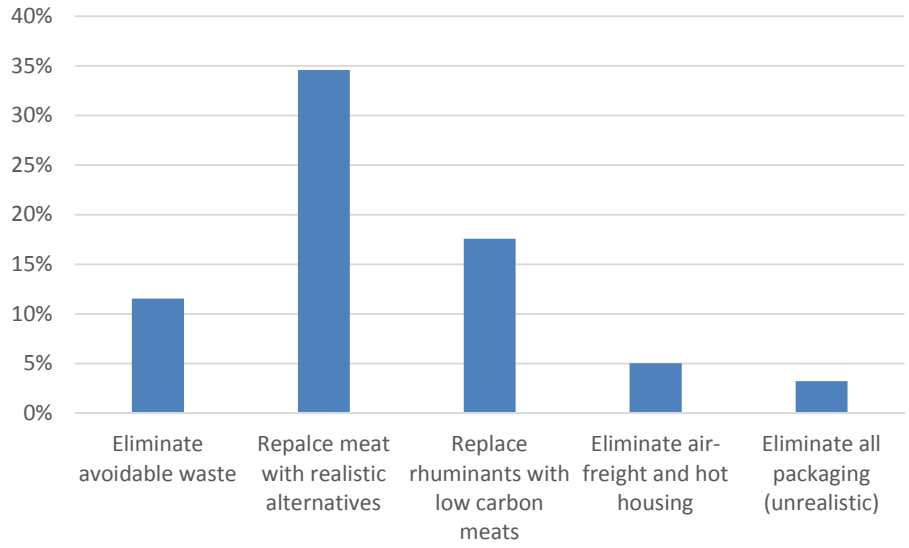

Figure 5: Greenhouse gas savings from consumer food scenarios

[70] Hoolohan, Berners-Lee, McKinstry-West and Hewitt, (in press) 'Mitigating the greenhouse gas emissions embodied in food through realistic consumer choices'. Energy Policy.

8. Who can bring about sustainable food practices?

In this section we identify some of the main participants in the food system and look, in broad terms, at the extent to which they can influence food practices.

- **Manchester City Council departments**. There are several departments and initiatives within the Council's remit (e.g. planning department and initiatives such as the Strategic Regeneration Framework) that impact, either directly or indirectly, on the food agenda. It is important that the Council ensures that policy across departments is aligned.
- **Food Futures** has a strategic role, specifically to promote and develop sustainable food initiatives across Manchester.
- **Community food groups** have proven capability to engage people, especially in growing but also in cooking and educational initiatives. Community growing initiatives require on-going financial support as the social benefits take time to establish, and experience around the UK suggests that it is unrealistic to expect them to become self-funding. They also rely heavily on volunteers, who need to feel properly valued.
- **Retailers** have enormous influence over supply chains and, when they choose to exert it, over the full range of consumer food habits. Within Manchester there are examples of commercially successful food retailers that specialise in encouraging sustainable, healthy diets, especially for better off residents. At least one such retailer (Unicorn Grocery) did not intend to expand, but expressed a willingness to support the establishment of like-minded enterprises. By supporting this goodwill, the council may be able to multiply the benefits of its own investment in this area. It is also clear that mainstream supermarkets have great potential to influence supply chains, diets and waste but the difficulty from a policy perspective is that the council probably has little influence over them. Market forces have resulted in a lack of availability of fruit and vegetables in some poorer areas of Manchester where demand is low. A fruit and veg van scheme has required ongoing funding, and this is likely to be the case for other actions to increase availability until demand can be increased.
- **Catering services (public and private)** have potential for influencing both consumer habits and encouraging sustainable supply chains. Schools, universities, hospitals and prisons are responsible for feeding people at key developmental moments in their lives, providing the diets they need and influencing long term food habits. In the case of schools, this is an area over which Manchester City Council has a strong degree of control. In terms of the supply chain, simple procurement criteria stand to boost local and sustainable agriculture, as well as fair trade, with benefits to the environment, the economy and society. Improvements in waste track directly though to financial savings.
- **Fast food outlets**, **restaurants, cafes & pubs.** Whilst fast food and takeaways often have poor nutritional and environmental credentials, there is no inherent reason why this needs to be the case. For a relatively affluent market, Pret A Manger demonstrates what is possible, with strong attention paid to all our sustainability criteria. Encouraging fast food outlets to introduce healthy affordable fast food may also be one of the most effective ways to improve diets among the less well off, not least because it goes with the grain of current UK trends rather than requiring major consumer behaviour change. These outlets, like supermarkets, have great capacity to influence consumer choice and behaviour and should be supported to do so. Truly Good Food – a food accreditation system for Manchester – has

recently been developed by Food Futures to do this. Food outlets can also work with organisations that reuse or recycle food. There is potential to engage with customers over portion sizes in order to reduce waste.

- **Wholesalers** are key players in the food chain, and are in a strong position to source more sustainable food. They can (and New Smithfield Market does) reduce waste by working with redistribution schemes, although these currently tend to lack the necessary funding to scale-up their operations. This is an area in which the Council can provide support. Where waste is unavoidable, wholesalers can mitigate the impact to a small extent by working with schemes to create energy, compost or animal feed.
- **Consumers** arguably have the greatest influence over the extent to which all sustainable food criteria are met. However, changing their behaviour just through campaigns or direct messages is notoriously difficult. Nevertheless, a more practice-oriented approach, where skills, infrastructures (e.g. where fruit and vegetables are available), as well as the social meaning of what it is to eat healthily and sustainably, may offer inroads.
- **Growers** are the key players in improving the quality of Manchester's agricultural land. Support here will be good for jobs and GVA to the relatively limited extent to which Manchester has food growing capacity. The agriculture industry in Manchester has a GVA of just £4 .2million, or 0.03% of Manchester's total GVA. Supporting farmers to reduce food waste by working with food recycling initiatives would also be worthwhile.
- **Manufacturers** clearly have a major role to play in reducing waste, choosing and sourcing sustainable ingredients, improving the nutritional content of processed foods and adopting responsible packaging. It is likely that the city council will find it difficult to influence this except through its influence on UK policy. Whilst the Food and Drink manufacturing industry in Manchester is significant (£115m, 0.8% of Manchester's GVA) the vast majority of this is not strongly connected to local supply chains[71].

[71] All industry GVA data from Greater Manchester Forecast Model District Data (New Economy Manchester), 2011. Retrieved June, 7, 2011, from http://neweconomymanchester.com/stories/1119-greater_manchester_forecasting_model

9. Recommendations

The recommendations are based upon the evidence presented in this report, and incorporate the recent Food Futures Expert Panel[72] recommendations and other research and city-wide priorities; they have been written in conjunction with city council staff and other interested parties.

Ultimately there is a need to scale up the impact of sustainable food initiatives if Manchester is serious about this agenda. The economic case alone for healthier diets looks compelling enough to justify investment, even though collaboration between public sector bodies is required for this to be apparent.

The successful delivery of the recommendations will be a core element of delivering the city's Growth and Reform Agenda[73] in future years – the city has fewer resources, against a growing and ageing population. Partnerships that enable and support organisations and initiatives to contribute to the sustainable food landscape in Manchester should be nurtured and embedded within the food agenda.

The following broad recommendations are designed to target effort where it can make the most difference, based upon our analysis. Where possible they are designed to build upon existing momentum, and make best use of existing resources including goodwill and expertise in the city as well as the Council's own procurement power.

9.1 Support and value volunteers

Volunteers are a critical resource for both maintaining impetus and delivering action on the ground across Manchester's sustainable food landscape. Many of the existing schemes are proving to be highly effective and bringing real, including economic, benefits to the city. Resources, including financial support for volunteers and voluntary schemes stand to deliver a high return on small investments. In addition, volunteering supports skills development of the labour market, as well as providing opportunities to help people back into employment.

We endorse Growing Manchester's[74] recommendation that it is important the council does what it can to value people's efforts, to enable them to do their work effectively and maximise the non-financial rewards that volunteers receive.

It is vitally important for the public sector and third sector to work together to support projects, identify funding and provide advocacy and networking.

9.2 Support community food initiatives

Community food initiatives and outlets including growing, cooking and eating schemes do not currently have the capacity to supply Manchester's food, and in addition it is not feasible to grow a significant proportion of Manchester's food supply through these schemes. However they stand to have great value in building social capital, encouraging more sustainable attitudes towards food, and

[72] Manchester Food Futures Expert Panel, Report and Recommendations, May 2012, Dr Angela Coulton.

[73] http://www.manchester.gov.uk/site/scripts/google_results.php?q=community+strategy+narrative

[74] Growing Manchester Evaluation Report, University of Manchester, January 2013.http://www.foodfutures.info/www/index.php?option=com_content&view=article&id=164:growing-manchester-evaluation-report-published&catid=1:latest-news&Itemid=50

in keeping people healthy through exercise, stress relief and general well-being. For people without work they stand to improve employability through engagement in purposeful activity.

Real Food Wythenshawe[75] is a project that encapsulates growing, cooking and eating, and offers an important experiment and a potential model from which other projects in the city can build. It will be important to learn well from the lessons learned and share the learning experiences from this project.

Experience from other community food initiatives, suggests the following guidance for policy makers in supporting community food initiatives:

- The social capital benefits take time to gain momentum, therefore it is especially important to have secure support for several years;
- It is challenging for small scale community food initiatives to be self-funded and it is vital to ensure projects have the time and resources they need,
- Even with funding, these schemes are highly dependent on volunteers, and it is essential that staff are helped to feel valued for their contribution, and
- Measuring impact and monitoring progress need to be included and embedded within the schemes.

Further useful practical recommendations can be found in the Growing Manchester Evaluation report and in the academic paper 'Diversity in community gardens: Evidence from one region in the United Kingdom' (http://www.tandfonline.com/doi/abs/10.1080/01448765.2012.706400).

9.3 Education and skills in healthy and sustainable food

In order to make the necessary shift in dietary consumption, increasing education, awareness and skills across the majority of Manchester residents will be essential. As well as the obvious health benefits there are significant financial benefits associated with healthier residents who know how to eat and cook well.

Many of the recommendations outlined in the report afford the opportunity to educate and engage people in healthy and sustainable food skills and knowledge, be it cooking skills, nutrition, horticulture or food shopping and storage, and this should be incorporated as a cross-cutting strand.

In addition, we recommend that healthy and sustainable food education continue to be supported for children and young people in a variety of settings – including schools, nurseries, community groups and in the home – to ensure future generations are given the best chance to eat well throughout their lives.

9.4 Trial healthy, sustainable fast food outlets

Fast food outlets dominate many of the shopping centres in Manchester's disadvantaged residential areas, where a few decades ago there would have been grocery retailers, including a great deal more fresh fruit and vegetables than are available today. There is evidence that unhealthy fast food is more prevalent among the more disadvantaged sections of society[76]. Very often this is costly, and

[75] Real Food Wythenshawe www.realfoodwythenshawe.com

[76] GM Poverty Commission http://www.povertymanchester.org/

not environmentally friendly. However, there is no inherent reason why desirable fast food should not be affordable, healthy and significantly more sustainable than the average UK diet.

Whilst encouraging people to develop cooking skills is important, it may be easier to bring about dietary improvements, for both health and environmental benefits, by going 'with the grain' of existing habits and social norms. For this reason we recommend a trial initiative to provide more sustainable alternatives to existing fast food outlets, focused in deprived residential areas in which availability of healthy food options is low. These outlets should ensure that what they offer is:

- Affordable;
- An improvement on existing fast food offers in terms of diet (less saturated fat, lower salt and sugar, more vegetables and fruit);
- An improvement in terms of environmental impact (less meat and especially less beef and lamb, seasonal and, if possible without undue impact on price, more sustainably sourced); and
- Seen as delicious by local residents.

Options for the development of healthy fast food outlets might include one, or a combination, of the following:

- Supporting the set-up of social enterprises (preferably community-led) to establish new outlets. These may be pop-ups or permanent, and either in empty retail spaces (at significantly reduced or free rates) or burger vans/catering trailers. There is also potential to add value to such schemes through training and employment opportunities for disadvantaged young people (see http://shoreditchtrust.org.uk/Skills-For-Life for an example of how this can be done);
- Supporting the transition of existing outlets to offer healthier menus. Such support could include provision of training for fast food catering staff (perhaps from one of Manchester's existing sustainable food initiatives), reduced business rates and other in-kind support (e.g. help with website design, and design and printing of promotional materials, etc.); and/or
- Supporting public sector catering services to expand into this market, keeping a focus on sustainable healthy fast food.

However the impetus needs to be driven from private sector organisations rather than the public sector Manchester City Council's role is to enable and support organisations to serve healthy and fresh food through schemes such as the Truly Good Food Award Scheme[77].

9.5 Support existing enterprises in nurturing similar initiatives

There are many small but successful initiatives to create sustainable local supply chain infrastructure. Although as yet they collectively represent only a very small proportion of Manchester's food supply chain, there is potential for growth and some are willing to support the creation of sibling initiatives. The Unicorn Food co-operative is one key example that uses the co-operative ethos to support other similar organisations and share the way they do business.

[77] Truly Good Food Award Scheme (www.truy-good-food.co.uk

We recommend that successful organisations and initiatives be supported in providing guidance to the development of like-minded initiatives in the city. This may include supporting successful entrepreneurial organisations such as, for example, Unicorn Grocery, Kindling Trust or Glebelands City Growers, through financial and enterprise advice, to be mentors to start-ups. Sharing the experiences and learning from Real Food Wythenshawe Programme are also key.

We would encourage these not always to be purist in their organic or local sourcing principles, especially when working with projects designed primarily to improve health and wellbeing among the least well off.

9.6 Sustainable food procurement

Public sector catering services have potential to reach people in large numbers at key developmental moments in their lives, providing the diets they need and influencing long-term food habits.

Through their scale of procurement these services they also have potential to support small, local and sustainable businesses down the supply chains and to exert pressure for sustainability down the supply chain.

The priority catering services include:

- Schools, since they can improve education directly through better diets (e.g. increasing attention spans and mental alertness[78]) and can also help children to adopt life-long healthy attitudes to food;
- Universities, since they provide large volumes of food through a wide variety of catering outlets including food in residential halls;
- Hospitals, since healthy diets can improve recovery rates directly, and they also cater for people at health-conscious moments of their lives, and moments of disruptions when new habits become more possible;
- Prisons, given the link between diet and health, well-being and behaviour.

We recommend that catering provision follows the sustainable food priorities, as laid out in our matrix, and that a pragmatic approach is taken to the principles of sustainable food sourcing, with sustainable supply chain criteria incorporated into the procurement process. These might include:

- Dietary criteria for health and environmental responsibility, including a move from more carbon intensive red meats to either vegetarian food or less carbon intensive meats such as chicken. This can be encouraged through initiatives such as meat-free days as provided in Manchester schools where Manchester Fayre[79] provides a service.
- Favouring local supply chains, with a hierarchy of preference from local to regional to UK to rest of world.
- Avoiding air-freighting and avoiding procuring fruit and vegetables that have been grown in heated greenhouses.
- Procuring fish and sea food from sustainable sources.

[78] Food For Life Partnership http://www.foodforlife.org.uk

[79] Manchester Fayre http://www.manchester.gov.uk/info/500290/school_meals/5969/school_meals_from_manchester_fayre

- Favouring organic and Fair Trade.

Engaging with end-users of the catering services on the sustainable food agenda can add value by generating greater awareness of the issues.

9.7 Support the expansion of schemes that divert food from waste to people in need.

The diversion of food from waste to human consumption is a simple efficiency that stands to be one of the most effective ways of improving the food system, whilst also helping to alleviate food poverty. There are numerous schemes in Manchester aiming to achieve this, including FareShare North West. However, as with many sustainable food initiatives, they suffer from lack of resources, and are heavily dependent on volunteers. Significant increases in the tonnage of fresh food could be achieved with additional resources.

This is one key area for which financial support is needed.

9.8 Metrics

At this stage, taking action may be more important than measuring progress. Bespoke metrics for the many facets of Manchester's sustainable food agenda will require significant resources and it would be a mistake for this to be at the expense of support for well-targeted initiatives on the ground.

The most practical way to measure progress may be to monitor the impact of known actions on the ground, rather than to attempt to monitor the whole food system. In depth one to one analysis of people involved in key initiatives may often be useful for this. The emphasis should be placed on the elements of the sustainability agenda that each initiative is designed to target. For example, it is more important that Real Food Wythenshawe looks at who becomes involved and with what benefits to them and the community than monitoring the actual food produced. However, if a wholesale assessment of food practices were to be attempted, the 2010 Scoping Study[80] estimated a fee of £40,000 for a resident survey. This could be of some value, both in identifying needs and, if repeated at intervals, tracking change.

Mapping the availability of healthy food may also be a relatively simple exercise to inform supply side interventions.

There may also be opportunities to work with local universities to research and measure the impact of food policy and programmes.

9.9 Leadership and Governance

The sustainable food agenda would benefit from a strengthening of its governance and leadership in the city to help to drive forward the recommendations and bring partners across sectors together to join up their efforts and champion the work to a wider audience. Manchester Food Futures Expert

[80] Scoping the Baseline of Sustainable Food Consumption and Production, Debbie Ellen, 2010 http://www.foodfutures.info/www/images/stories/pdf/Scoping%20Sustainable%20Consumption%20and%20Production%20in%20Manchester%20-%20Final%20Report.pdf

Panel[81] made recommendations for the establishment of an independent Food Board and we would see that as a useful step.

9.10 Lobbying and influencing national policy

Manchester City Council, having carried out a consumption-based carbon footprint and, now, a more detailed exploration of the sustainable food system, should be in a good position to influence national policy in this area. It has already demonstrated its capacity for national influence through its significant input into the Select Committee report into Consumption Based Metrics[82].

While it is beyond the scope of this project to make specific recommendations in this regard, there are several areas that may be worth pursuing:

- Advertising: the influence of advertising over consumer choice is beyond doubt, and can be harmful if the wrong products are promoted. Armed with knowledge of what constitutes a sustainable food system, Manchester City Council could aim to influence advertising policy (for example, lobby Government to ban the advertising of sugary drinks and snacks, etc.).
- Planning Policy: there is a need to work with Manchester's Planning department and Neighbourhood Regeneration teams to support the sustainable food agenda and explore how future strategic plans such as the Core Strategy and Strategic Regeneration Frameworks could enable the sustainable food actions within the city's climate change action plan; Manchester – A Certain Future[83].
- Food labelling.

[81] Angela Coulton, 2012, Manchester Food Futures Expert Panel Report and Recommendations. Available at: http://www.foodfutures.info

[82] Consumption Based Emissions Reporting: House of Commons Select Committee for Energy and Climate Change, April 2012

[83] Manchester – A Certain Future (www.manchesterclimate.com)

10. Refining the MACF headline aims and objectives

The city wrote its Climate Change Action Plan - *Manchester - A Certain Future* in 2009. As part of its commitment to refresh the actions after 3 years, a refresh process was undertaken in 2012. As part of this a set of actions for 2013 - 2015 were developed by a group of local experts and stakeholders. The actions are designed to achieve outcomes by 2015, while also preparing the city for future activity that will need to be taken beyond that time. Given the importance of food in Manchester's emission profile, this is included as a key theme, for which a headline aim was developed, accompanied by a series of specific headline objectives from 2015. It is intended that these be used to guide progress on the sustainable food agenda.

10.1 MACF headline aim

The current wording for the 'sustainable consumption and production of food' aim is as follows:

Headline aim: to build a better understanding of the food systems that support Manchester, create strong links between healthy diets and sustainability, and to develop opportunities to build local supply chains that support local businesses and reduce risks to future food security.

Since the link between local supply chains and sustainability is not to be as strong as has sometimes been assumed, and since some of the criteria and key practices that lead to their fulfilment are not adequately represented in the aims, we recommend the following revision:

Revised headline aim: to build a better understanding of the food systems that support Manchester, to encourage and enable healthy, affordable and sustainable diets, to develop opportunities to build sustainable supply chains, to support community food projects, to reduce waste, and reduce risks to future food security.

10.2 MACF headline objectives

These currently read as follows:

Headlines from 2015

1) By making land available and providing support, community food-growing projects will have sprung up all over the city, including schemes delivered as part of neighbourhood regeneration schemes and new developments.

2) Community growing, local food production and consumption and reducing food waste will have a higher public profile through exemplar projects such as Wythenshawe Real Food, and FareShare.

3) There will be an increase in Manchester-based businesses growing and processing food commercially for sale within the city.

4) Further progress will have been made in reducing and recycling domestic food waste, and initiatives that reduce and recycle commercial food waste will be increasing in scope and scale.

5) Manchester will have begun to build a reputation as a destination for sustainable food through large events and festivals, as well as neighbourhood food markets and projects.

We suggest modifications along the lines of the version below, to reflect the importance of dietary change. We have also reduced the emphasis on locally produced food being consumed locally, since this is not as critical as is often assumed.

Headlines from 2015

1) By making land available and providing support, community food-growing projects will have sprung up all over the city, including schemes delivered as part of neighbourhood regeneration schemes and new developments.

2) Community growing, local food production, and reducing food waste will have a higher public profile through exemplar projects such as Wythenshawe Real Food, and FareShare North West.

3) Healthy, sustainable diets will be universally available through shops, fast food and catering services.

4) Diets throughout the city will be both healthier and more sustainable (including through less meat, especially red meat, and more seasonal fruit and vegetables).

5) Further progress will have been made in reducing and recycling domestic food waste, and initiatives that reduce and recycle commercial food waste will be increasing in scope and scale.

6) Manchester will have begun to build a reputation as a destination for sustainable food through large events and festivals, as well as neighbourhood food markets and projects.

Appendix 1: Sustainable Food Cities Network

The Sustainable Food Cities Network[84] is an alliance of public, private and third sector organisations led by the Soil Association, Food matters and Sustain that seeks to develop best practice in all aspects of sustainable food. Their aim is to encourage public agencies, NGOs, businesses and communities to work together to make healthy and sustainable food a defining characteristic of where they live, and thus fits well with Manchester City Council's sustainable food agenda.

The network has already worked with numerous communities across the country, including those in Manchester (Manchester Food Futures[85] and Feeding Manchester[86]). The findings from these initiatives have highlighted eight key issues that they consider worth exploring when establishing a sustainable food programme. These include:

1. Sustainable supply chains;
2. Community food projects;
3. Food knowledge and skills;
4. Public sector food;
5. Food enterprises;
6. Food poverty and access;
7. Healthy and sustainable diets; and
8. Food waste.

84 See more information about the network on their website: http://www.sustainablefoodcities.org/

85 Manchester Food Futures. (no date). Retrieved from http://www.sustainablefoodcities.org/findacity/cityinformation/userid/46

86 Feeding Manchester. (no date). Retrieved from http://www.sustainablefoodcities.org/findacity/cityinformation/userid/24

Appendix 2: Literature review

Title	Reference	Notes
Growing Manchester	Food Futures homepage. (no date). Retrieved from www.foodfutures.info	A programme run by Food Futures has now been expanded to include support for 45 projects community food growing projects across the city in a range of locations and settings. Projects joining the programme include primary and secondary school growing schemes, children's centres, and community allotments and supported housing projects.
Cracking Good Food	Cracking Good Food homepage. (no date). Retrieved from www.crackinggoodfood.org	A Manchester based cooking network. Teaching cooking from scratch through practical workshops and courses using local, affordable, and seasonal food.
Hulme Community Garden Centre and Debdale Eco-Centre	Hulme Community Gardent Centre homepage. (no date). Retrieved from www.hulmegardencentre.org.uk Debdale EcoCentre homepage. (no date). Retrieved from www.debdale-ecocentre.org.uk	Based in the south of the city and Debdale to the east, provide community led growing and horticulture support, projects and training for Manchester residents with the aim of bringing the community together through gardening. The centres provide support for people making the first step into food growing, and run a variety of courses, training and volunteer opportunities.
Feeding Manchester	Feeding Manchester homepage. (no date). Retrieved from www.feedingmanchester.org.uk	A network and website for people who love and want to eat sustainable food. The interactive sustainable food map shows where to buy and eat sustainable food in Greater Manchester.
Manchester Alliance for Community Care	Macc. (no date). Food Resource Pack Index. Retrieved from http://www.macc.org.uk/node/884	Producer of an excellent Food Resource pack including guides, resources and helpful tips.
Manchester Alliance for Community Care, Case Studies	Macc. (no date). Case studies. Retrieved from http://www.macc.org.uk/node/888	A food resource pack including a number of resources and case studies about food which can be viewed on the website.
Manchester Alliance for Community Care, Directory of Community Gardens.	Macc, 2005. Community Gardening in the City. Permaculture Magazine, No.46, pp.45–47. Retrieved from http://www.macc.org.uk/sites/macc.org.uk/files/LeafStreetArticle.pdf	MACC have also produced a case study of community gardens.

Title	Reference	Notes
Incredible Edible Todmorden	Incredible Edible Todmorden homepage. (no date). Retrieved from http://www.incredible-edible-todmorden.co.uk/	Local people working together for a world where we all share responsibility for the future wellbeing of our planet and ourselves. They aim to provide access to good local food for all, through working together.
Real Food Wythenshawe	Real Food Wythenshawe homepage. (no date). Retrieved from www.realfoodwythenshawe.com	A large lottery funded programme of growing, cooking and engaging with fresh, local and sustainable food.
What's Cooking	Bows, A., McLachlan, C., Mander, S., Wood, R., Roeder, M., Thornley, P., Gough, C., Thom, L., and Dawkins, E., 2012. What's Cooking: Adaptation and Mitigation in the UK Food System.	A research report by the SCI exploring scenarios changed by mitigation and adaptation to different levels of climate change. Dietary choices and pressures on Manchester consumers are examined through focus groups.
Manchester: A Certain Future	Manchester City Council, 2009. Manchester: A Certain Future – our collective action on climate change.	Manchester City's climate change action plan. Its two aims are: 1) To reduce the city's carbon emissions by 41% by 2020 and 2) to engage all individuals, neighbourhoods and organisations in a process of cultural change that embeds low carbon thinking into the lifestyles and operations of the city.
Mitigating the greenhouse gas emissions embodied in food through realistic consumer choices	Hoolohan, C., Berners-Lee, M., McKinstry-West, J. and Hewitt, C. (in press) Mitigating the greenhouse gas emissions embodied in food through realistic consumer choices. Energy Policy.	Quantifies emissions savings that are achievable through a short list of simple consumer choices.
Food Strategy for Manchester	Manchester City Council, 2006. Food Futures: A Food Strategy for Manchester	An early version of the type of strategy currently being looked at now.
Land use change scenarios for Greater Manchester: analysis and implications for climate change adaptation	Carter, J., 2012. Land Use Change Scenarios for Greater Manchester: Analysis and Implications for Climate Change Adaptation	Land-use baseline map for Greater Manchester and explores how this land use might be impacted by climate change in future. Makes reference to farmland, trends in the past, as well as potential change in 2050.

Title	Reference	Notes
Making local food sustainable in Manchester	Levidow, L., and Psarikidou, K., 2012. Making local food sustainable in Manchester. In: Viljoen, Andre and Wiskerke, Johannes S. C. (eds.) Sustainable Food Planning: Evolving Theory and Practice. Wageninen , pp 207-221	Book chapter recently published on sustainability and localism in Manchester. Makes reference to the 'food futures' report above. Concludes that health has been brought into the agenda.
Simulating Land Use changes in Greater Manchester using Agent Based Modelling Technique	Adla, R., 2010. Simulating Land Use changes in Greater Manchester using Agent Based Modelling Technique. An MSc dissertation.	Masters thesis using agent based modelling but has baseline land-use data around Manchester
Building-Based Urban Land Use Classification from Vector Databases in Manchester UK	Hussain, M., Barr, R., and Chen, D., 2012. Building-Based Urban Land Use Classification from Vector Databases in Manchester UK.	map of urban land use around GM that focuses on buildings but includes 'large open spaces' that could provide a figure for usable land
Key Note Market Assessment 2012 of Cooking and Eating Habits in the UK	KeyNote, 2012. Market Assessment 2012: Cooking & Eating Habits. Seventh Edition.	A broad market assessment including recession information and influences on UK consumers buying more store-brand products in supermarkets, as well as responding to rising prices due to climate impacts.
Methods for mapping local food production capacity from agricultural statistics	Morrison, K.T., Nelson, T.A., and Ostry, A.S., 2011. Methods for mapping local food production capacity from agricultural statistics. Agricultural Systems 104 (2011) 491–499.	Potential methods for using government data to assess food production.
Greenhouse gas benefits of fighting obesity	Michaelowa, A., and Dransfeld, B., 2008. Greenhouse gas benefits of fighting obesity. Ecological Economics, 66, pp.298–308	Estimates GHG savings from different policy measures to reduce obesity.

Title	Reference	Notes
Do food deserts influence fruit and vegetable consumption?	Pearson, T., Russell, J., Campbell, M.J., and Barker, M.E.. 2005. Do 'food deserts' influence fruit and vegetable consumption? A cross-sectional study. Appetite, 45(2), pp.195–197.	Surveys families to assess access and purchase of fruit and veg - useful as it demonstrates food deserts are not the major driver behind people eating less fruit and veg suggesting remedying this in Manchester is not likely on its own to increase fruit and veg intake
Changes in the value of ecosystem services along a rural-urban gradient: A case study of Greater Manchester	Radford, K.G., and James, P., 2012. Changes in the value of ecosystem services along a rural-urban gradient: A case study of Greater Manchester, UK. Landscape and Urban Planning, 109(1), pp.117–127.	Assesses ecosystem services in Manchester
Ecological citizenship and sustainable consumption: Examining local organic food networks	Seyfang, G., 2006. Ecological citizenship and sustainable consumption: Examining local organic food networks. Journal of Rural Studies, 22(4), pp.383–395.	Paper suggests ecological citizenship as motivating force for sustainable consumption behaviour. Useful for identifying factors that could change Manchester resident's behaviours
Towards healthy local food: issues in achieving Just Sustainability	Sherriff, G., 2009. Towards healthy local food: Issues in achieving Just Sustainability. Local Environment, 14(1), pp.73–92.	Assesses the Bentley Bulk local food initiative piloted in Manchester in 2003. Potential useful interventions for the success of alternative initiatives.
Putting place on the menu: The negotiation of locality in UK food tourism, from production to consumption	Simms, R., 2010. Putting place on the menu: The negotiation of locality in UK food tourism, from production to consumption. Journal of Rural Studies, 26(2), pp.105–115.	Identifies how co benefits could arise (or not) from local food production and consumption.

Title	Reference	Notes
Growing the social: alternative agrofoodnetworks and social sustainability in the urban ethical foodscape	Psarikidou, K., and Szerszynski, B., 2012. Growing the social: Alternative agrofoodnetworks and social sustainability in the urban ethical foodscape. Sustainability: Science, Practice, & Policy 8(1), pp.30–39.	Descriptions of different agrofood networks in Manchester and how they manifest aspects of social sustainability.
In search of the concerned consumer: UK public perceptions of food farming and buying locally	Weatherall, C., Tregear, A., and Allinson, J., 2003. In search of the concerned consumer: UK public perceptions of food farming and buying locally. Journal of Rural Studies, 19, pp.233–244.	Consumers existing attitudes to food.
The use of feedback to enhance environmental outcomes: a randomised control trial of a food waste scheme	Nomura, H., John, P.C., and Cotterill, S., 2011. The use of feedback to enhance environmental outcomes: A randomised control trial of a food waste scheme. Local Environment: The International Journal of Justice and Sustainability, 16(7), pp.637–653.	Case study of Oldham to assess different methods to increase food waste recycling.
Who Feeds Bristol - Towards a resilient food plan	Carey, J., 2011. Who Feeds Bristol? Towards a resilient food plan.	A baseline report about similar agendas in Bristol.
Food Printing Oxford Report	Curtis, T., et al., 2013. Food Printing Oxford: How to feed a city	Report looking at blueprint for food sustainability in Oxford.
The Impact of an Allotment Group on Mental Health Clients' Health, Wellbeing and Social Networking	Fieldhouse, J., 2003. The Impact of an Allotment Group on Mental Health Clients' Health, Wellbeing and Social Networking. The British Journal of Occupational Therapy, 55(7), pp.286–296.	The study concludes that there are particular qualities of the plant-person relationship that promote people's interaction with their environment and hence their health, functional level and subjective wellbeing. The embeddedness of allotments within communities means that they have great potential as media for occupational therapy and as mechanisms for social inclusion.

Title	Reference	Notes
Cultivating health': therapeutic landscapes and older people in northern England	Milligan, C., Gatrell, A., and Bingley, A., 2004. Cultivating health': therapeutic landscapes and older people in northern England. Social Science & Medicine, 58(9), pp 1781–1792.	Based on the findings of the study, they illustrate the sense of achievement, satisfaction and aesthetic pleasure that older people can gain from their gardening activity. However, while older people continue to enjoy the pursuit of gardening, the physical shortcomings attached to the aging process means they may increasingly require support to do so. Communal gardening on allotment sites, it's maintained, creates inclusionary spaces in which older people benefit from gardening activity in a mutually supportive environment that combats social isolation and contributes to the development of their social networks.
Health benefits of 'grow your own' food in urban areas: Implications for contaminated land risk assessment and risk management?	Leake, J., Adam-Bradford, A., Rigby, J.E., 2009. Health benefits of 'grow your own' food in urban areas: Implications for contaminated land risk assessment and risk management? Environmental Health 2009; 8(Suppl 1): S6.	The concern here is that urban environments for food production often have higher levels of contamination, which are not properly assessed. Study notes that rarely do pollutants in GYO food exceed statutory limits set for commercial food and few people obtain the majority of their food from GYO. The study argues that the health & wider benefits should be taken into account when assessing the net effect on human health of GYO.
Vitamin G: effects of green space on health, well-being, and social safety	Groenewegen, P.P., van den Berg, A.E., de Vries, S., and Verheij, R.A., 2006. Vitamin G: effects of green space on health, well-being, and social safety, BMC Public Health 2006, 6(149).	There is general widespread evidence that green space has positive health impacts. But this is not allotments or food related necessarily. This article cites many others with regard to such evidence but also looks specifically at allotment gardens.
Community gardens: Lessons learned from California healthy cities and communities	Twiss, J., Dickinson, J., Duma, S., Kleinman, T., Paulsen, H., and Rilveria, L., 2003. Community gardens: Lessons learned from California healthy cities and communities., Am J Public Health, 93(9), pp.1435-1438.	Previous (experimental) research in environmental psychology has shown that a natural environment has a positive effect on well-being through restoration of stress and attentional fatigue. In this paper particularly: These gardens (allotments) are now generally assumed to contribute to a wide array of public health and liveability issues Beneficial effects of allotment gardens have been attributed to various factors, including enhanced physical activities, reduced levels of stress and mental fatigue, and a better social and cultural integration [31,32]. Gardening activities have typically been related to specific health benefits such as reduced cholesterol levels [36]. But there is some evidence that activities on allotment gardens may also contribute to health and well-being in a more general way [37].

Title	Reference	Notes
Takeaways Toolkit, tools interventions and case studies to help local authorities develop a response to the health impacts of fast food takeaways	Chartered Institute of Environmental Health, 2012. Takeaways toolkit: Tools interventions and case studies to help local authorities develop a response to the health impacts of fast food takeaways.	Provides a set of interventions that LA Env Health Officers and Planning Officers can do to improve healthiness of takeaways and restrict school children's access to takeaways
Fruit and vegetable intake among urban community gardeners	Alaimo, K., Packnett, E., Miles, R., and Kruger, D., 2008. Fruit and vegetable intake among urban community gardeners. J Nutr Educ Behav., 40(2), pp.94-101.	Adults with a household member who participated in a community garden consumed fruits and vegetables 1.4 more times per day than those who did not participate, and they were 3.5 times more likely to consume fruits and vegetables at least 5 times daily. Fruit and vegetable intake was measured using questionnaire items from the Behavioural Risk Factor Surveillance System. Household participation in a community garden was assessed by asking the respondent if he or she, or any member of the household, had participated in a community garden project in the last year. Results based on a random phone survey of city residents.
Linking soil biodiversity and agricultural soil management	Thiele-Bruhn, S., Bloem, J., de Vries, F.T., Kalbitz, K., and Wagg, C., 2012. Linking soil biodiversity and agricultural soil management. Current Opinion in Environmental Sustainability, 4(5), pp.523-528.	Paper looking at the benefits of organic farming over conventional farming in terms of soil biodiversity. The paper reviews others' work and finds that biodiversity is replaced by a regulation process that is damaged when fertilizers and agrochemicals are used. They conclude that agricultural systems with fewer inputs may promote self-regulating systems and higher biodiversity, but decrease yields. They also state that high biodiversity is not mere decoration but significant for soil functioning. They say that indicators of soil biodiversity can be used as sensitive measures of adverse effects.
Environmental Impact of Different Agricultural Management Practices: Conventional vs. Organic Agriculture	Gomiero, T., Pimentel, D., and Paoletti, M.G., 2011. Environmental Impact of Different Agricultural Management Practices: Conventional vs. Organic Agriculture. Critical Reviews in Plant Sciences, 30(1), pp.95–124.	A review paper looking at organic vs. conventional farming practices. Rates many indicators relevant to sustainability by making a comparative review of the environmental performances of organic agriculture versus conventional farming, and also discusses the difficulties inherent in this comparison process. Defines 'organic agriculture' as - "Organic agriculture refers to a farming system that enhance soil fertility through maximizing the efficient use of local resources, while foregoing the use of agrochemicals, the use of Genetic Modified Organisms (GMO), as well as that of many synthetic compounds used as food additives."

Title	Reference	Notes
Organic agriculture promotes evenness and natural pest control	Crowder, D.W., Northfield, T.D., Strand, M.R., and Snyder, W.E., (2010) Organic agriculture promotes evenness and natural pest control. Nature, 466(7302).	Discusses that evenness of species is supported by organic farming, which gives greater resilience against pests and diseases. “Rejuvenation of ecosystem function requires restoration of species evenness, rather than just richness. Organic farming potentially offers a means of returning functional evenness to ecosystems".
Plant–microbial linkages and ecosystem nitrogen retention: lessons for sustainable agriculture	de Vries, F.T., and Bardgett, R.D., 2012. Plant–microbial linkages and ecosystem nitrogen retention: lessons for sustainable agriculture. Front Ecol Environ, 10(8), pp.425–432,	Discusses the damage done through excess nitrogen fertiliser input from conventional farming practices leading to significant nitrogen losses from soils. On the other hand, plant-microbial linkages that are tight, and fungal-dominated have soils with the greatest capacity to retain nitrogen. Thus, this adds weight to the argument that whilst yields are reduced, agricultural systems that promote plant-microbial linkages and nitrogen retention have benefits such as lower N2O emissions, climate change resistance, as well as greater resistance to pests and diseases, and greater carbon sequestration.
Long-term organic farming fosters below and aboveground biota: Implications for soil quality, biological control and productivity	Birkhofer et al., 2008. Long-term organic farming fosters below and aboveground biota: Implications for soil quality, biological control and productivity. Soil Biology & Biochemistry, 40(9), pp.2297-2308.	Organic farming may contribute substantially to future agricultural production worldwide by improving soil quality and pest control, thereby reducing environmental impacts of conventional farming.
Reduced nitrate leaching and enhanced denitrifier activity and efficiency in organically fertilized soils	Kramer et al. 2006. Reduced nitrate leaching and enhanced denitrifier activity and efficiency in organically fertilized soils. PNAS, 103(12), pp. 4522–4527.	One component of organic agriculture that remains in question is whether it can reduce agricultural N losses to groundwater and the atmosphere relative to conventional agriculture. Here we report reduced N pollution from organic and integrated farming systems compared with a conventional farming system. N2O emissions were not significantly different among treatments; however, N2 emissions were highest in organic plots. Annual nitrate leaching was 4.4 –5.6 times higher in conventional plots than in organic plots, with the integrated plots in between. This study demonstrates that organic and integrated fertilization practices.

Title	Reference	Notes
Soil Fertility and Biodiversity in Organic Farming	Mader, P., et al., 2002. Soil Fertility and Biodiversity in Organic Farming. Science 296(5573), pp.1693-1697.	An understanding of agro-ecosystems is key to determining effective farming systems. Here we report results from a 21-year study of agronomic and ecological performance of biodynamic, bioorganic, and conventional farming systems in Central Europe. We found crop yields to be 20% lower in the organic systems, although input of fertilizer and energy was reduced by 34 to 53% and pesticide input by 97%. Enhanced soil fertility and higher biodiversity found in organic plots may render these systems less dependent on external inputs.
Life cycle assessment of Swiss farming systems: I. Integrated and organic farming	Nemecek, T., Dubois, D., Huguenin-Elie, O., and Gaillard, G., 2011. Life cycle assessment of Swiss farming systems: I. Integrated and organic farming. Agricultural Systems, 104(3), pp.217-232.	Organic Farming (OF) was revealed to be either superior or similar to Integrated Production (IP) in environmental terms. OF has its main strengths in better resource conservation, since the farming system relies mainly on farm-internal resources and limits the input of external auxiliary materials. This results in less fossil and mineral resources being consumed. Moreover the greatly restricted use of pesticides makes it possible to markedly reduce ecotoxicity potentials on the one hand, and to achieve a higher biodiversity potential on the other. This overall positive assessment is not valid for all organic products: some products such as potatoes had higher environmental burdens than their counterparts from IP.
Does organic grassland farming benefit plant and arthropod diversity at the expense of yield and soil fertility?	Klaus, V.H., et al., 2013. Does organic grassland farming benefit plant and arthropod diversity at the expense of yield and soil fertility? Agriculture, Ecosystems & Environment, 177, pp.1-9.	Study of different ways of farming grasslands – organic and inorganic. This implies that permanent grasslands respond slower and probably weaker to organic management than crop fields do. However, as land-use intensity and inorganic soil phosphorus concentrations were significantly lower in organic grasslands, overcoming seed and dispersal limitation by re-introducing plant species might be needed to exploit the full ecological potential of organic grassland management. We conclude that although organic management did not automatically increase the diversity of all studied taxa, it is a reasonable and useful way to support agro-biodiversity.

Title	Reference	Notes
Does organic farming reduce environmental impacts? – A meta-analysis of European research	Tuomisto, H.L., Hodge, I.D., Riordan, P., and Macdonald, D.W., 2012. Does organic farming reduce environmental impacts? – A meta-analysis of European research. Journal of Environmental Management, 122, 309-320.	The results show that organic farming practices generally have positive impacts on the environment per unit of area, but not necessarily per product unit. Organic farms tend to have higher soil organic matter content and lower nutrient losses (nitrogen leaching, nitrous oxide emissions and ammonia emissions) per unit of field area. However, ammonia emissions, nitrogen leaching and nitrous oxide emissions per product unit were higher from organic systems. Organic systems had lower energy requirements, but higher land use, eutrophication potential and acidification potential per product unit. The key challenges in conventional farming are to improve soil quality (by versatile crop rotations and additions of organic material), recycle nutrients and enhance and protect biodiversity. In organic farming, the main challenges are to improve the nutrient management and increase yields. In order to reduce the environmental impacts of farming in Europe, research efforts and policies should be targeted to developing farming systems that produce high yields with low negative environmental impacts drawing on techniques from both organic and conventional systems.
Are Organic Foods Safer or Healthier Than Conventional Alternatives?: A Systematic Review	Smith-Spangler, C., et al., 2012. Are Organic Foods Safer or Healthier Than Conventional Alternatives?: A Systematic Review. Annals of Internal Medicine, 157(5), pp.348-366.	The published literature lacks strong evidence that organic foods are significantly more nutritious than conventional foods. Consumption of organic foods may reduce exposure to pesticide residues and antibiotic-resistant bacteria.
Polyphenol content and antioxidant capacity in organic and conventional plant foods	Faller, A.L.K, and Fialho, E., 2010. Polyphenol content and antioxidant capacity in organic and conventional plant foods. Journal of Food Composition and Analysis, 23(6), pp.561-568.	This study suggests that the effect of organic practices results in different effect patterns according to the plant species analysed, with fruits being more susceptible to the induction of polyphenol synthesis, and the greatest accumulation of polyphenols in external plant tissues. In general, organic agriculture results in food products with similar or slightly higher polyphenol content and antioxidant capacity.

Title	Reference	Notes
Organic food and impact on human health: Assessing the status quo and prospects of research	Huber, M., et al., 2011. Organic food and impact on human health: Assessing the status quo and prospects of research. NJAS – Wageningen Journal of Life Sciences, 58(3-4), pp.103-109.	A number of comparative studies showed lower nitrate contents and less pesticide residues, but usually higher levels of vitamin C and phenolic compounds in organic plant products, as well as higher levels of omega-3 fatty acids and conjugated linoleic acid in milk from organically raised animals. However, the variation in outcomes of comparative studies is very high, depending on plant fertilization, ripening stage and plant age at harvest, and weather conditions. Moreover, there appeared no simple relationship between nutritional value and health effects. It is difficult therefore to draw conclusions from analytical data about the health effects of organic foods.
What are the benefits of interacting with nature?	Keniger, L.E., et al , 2013. What are the benefits of interacting with nature? Environmental Research and Public Health, 10, pp.913-935.	The report reviews the benefits of interacting with nature. This includes the benefits of gardening, access to green space and community growing. It highlights the physical and mental wellbeing benefits of gardening, and social capital from community growing as well as a host of other types of interactions between people and nature.
Allotment gardening and health: a comparative survey among allotment gardeners and their neighbours without an allotment	van den Berg, A.E., van Winsum-Westra, M., de Vries, S., and van Dillen, S.M.E., 2010. Allotment gardening and health: A comparative survey among allotment gardeners and their neighbours without an allotment. Environmental Health, 9(74).	The study assesses the health outcomes of gardeners & non gardeners finding that elderly populations particularly appeared to have better health and well-being outcomes compared to non-gardening equivalents. Potentially because older gardeners are more oriented towards gardening and being active & less towards passive relaxation.
Gardening promotes neuroendocrine and affective restoration from stress	van den Berg, A.E., Custers, M.H., 2011. Gardening promotes neuroendocrine and affective restoration from stress. J. Health Psycol. 16(1), pp.3-11.	Stress-relieving effects of gardening were hypothesized and tested in a field experiment. Thirty allotment gardeners performed a stressful Stroop task and were then randomly assigned to 30 minutes of outdoor gardening or indoor reading on their own allotment plot. Salivary cortisol levels and self-reported mood were repeatedly measured. Gardening and reading each led to decreases in cortisol during the recovery period, but decreases were significantly stronger in the gardening group. Positive mood was fully restored after gardening, but further deteriorated during reading. These findings provide the first experimental evidence that gardening can promote relief from acute stress.

Title	Reference	Notes
Developing “community” in community gardens	Firth, C., Maye, D., and Pearson, P., 2011. Developing “community” in community gardens, Local Environment. The International Journal of Justice and Sustainability,16(6), pp.555-568.	Community gardens are enjoying a renaissance, thought to be due to people's desire to reconnect with food, nature and community. This paper presents results from an exploratory investigation of two community gardens in Nottingham, supported by regional and national contextual analysis. It examines the nature and construction of “community” in community gardens and how they benefit their local communities. Results from case-study work show how community gardens help to build cohesion and vitality in a community, contributing to the generation of bonding, bridging and linking social capital. The composition of these capitals varies between the case-study gardens, dependent on the type of community formed. Two categories of community garden are identified in the paper: “place-based” and “interest-based”. The former are more territorially embedded in the local community, while the latter may span across diverse communities, with the social capital generated remaining within an “interest community”. These categories may not always map neatly on to one community garden, although one category may be more immediately evident.
Fruit and vegetable intake among urban community gardeners	Alaimo, K., Packnett, E., Miles, R., and Kruger, D., 2008. Fruit and vegetable intake among urban community gardeners. J Nutr Educ Behav., 40(2), pp.94-101.	To determine the association between household participation in a community garden and fruit and vegetable consumption among urban adults in Flint Michigan. 766 adults took part in a cross sectional random phone survey conducted in 2003 representative of the city. Fruit and vegetable intake was measured using questionnaire items from the Behavioural Risk Factor Surveillance System. Household participation in a community garden was assessed by asking the respondent if he or she, or any member of the household, had participated in a community garden project in the last year. Generalized linear models and logistic regression models assessed the association between household participation in a community garden and fruit and vegetable intake, controlling for demographic, neighbourhood participation, and health variables. Adults with a household member who participated in a community garden consumed fruits and vegetables 1.4 more times per day than those who did not participate, and they were 3.5 times more likely to consume fruits and vegetables at least 5 times daily.

Title	Reference	Notes
Cultivating health': therapeutic landscapes and older people in northern England	Milligan, C., Gatrell, A., and Bingley, A., 2004. 'Cultivating health': therapeutic landscapes and older people in northern England. Social Science & Medicine, 58(9), pp.1781–1793.	While gardening is seen, essentially, as a leisure activity it has also been suggested that the cultivation of a garden plot offers a simple way of harnessing the healing power of nature (The therapeutic garden, Bantam Press, London, 2000). One implication of this is that gardens and gardening activity may offer a key site of comfort and a vital opportunity for an individual's emotional, physical and spiritual renewal. Understanding the extent to which this supposition may be grounded in evidence underpins this paper. In particular, we examine how communal gardening activity on allotments might contribute to the maintenance of health and wellbeing amongst older people. Drawing on recently completed research in northern England, we examine firstly the importance of the wider landscape and the domestic garden in the lives of older people. We then turn our attention to gardening activity on allotments. Based on the findings of our study, we illustrate the sense of achievement, satisfaction and aesthetic pleasure that older people can gain from their gardening activity. However, while older people continue to enjoy the pursuit of gardening, the physical shortcomings attached to the aging process means they may increasingly require support to do so. Communal gardening on allotment sites, we maintain, creates inclusionary spaces in which older people benefit from gardening activity in a mutually supportive environment that combats social isolation and contributes to the development of their social networks. By enhancing the quality of life and emotional wellbeing of older people, we maintain that communal gardening sites offer one practical way in which it may be possible to develop a 'therapeutic landscape'.
The therapeutic benefits of horticulture in a mental health service	Parkinson, S., Lowe, C., and Vecsey, T., 2011. The therapeutic benefits of horticulture in a mental health service. The British Journal of Occupational Therapy, 74(11), pp.525-534.	The investigators in this research study sought to determine those aspects of their horticultural projects that conferred the greatest therapeutic benefit to their clients. They used outcome measures to rate the responses of participants, paying particular attention to the participants' expressed motivation. The therapeutic value of horticulture arose from a complex interplay of personal factors, including gender-based preferences, individual interests and social needs. Conclusion: The benefits of engaging in horticultural activity are not automatic. The external environment provides challenges, which can be graded by the facilitators to maximise the therapeutic benefit.

Title	Reference	Notes
Diversity in community gardens: Evidence from one region in the United Kingdom	Pearson, D. H., and Firth, C., 2012. Diversity in community gardens: Evidence from one region in the United Kingdom. Biological Agriculture & Horticulture: An International Journal for Sustainable Production Systems. 28(3), pp.147-155.	Literature tends to assume that all community gardens are essentially the same and focuses on their potential contribution to environmental sustainability, human health, and social inclusion through the creating of a communal space for growing food products. This paper investigates differences that exist by profiling community gardens in one region in the United Kingdom. Community gardens were found to differ in how and when they were established, how they are managed and funded, as well as their size and who uses the site for a variety of purposes. From a list of many possibilities, the two most common objectives from their organisers were community development, through a range of food-related activities, and contributing to environmental sustainability. The evidence suggests that longevity is not certain as one third of the community gardens in the study region were not active. To enhance their durability, it would appear that individual gardens should aim to create a sense of ownership from within the local community as well as ensure that they are managed in ways that are consistent with the tenure of their funding source(s) and aspirations of their volunteers.
Pebbles Can.	'Peebles Can', 2001. Retrieved September 04, 2013, from http://peeblescan.org/	Peebles can is a new urban community garden project in Peebles. It aims to provide employability skills to young unemployed people, among other community benefits.

Appendix 3: List of interviewees

Organisation	Name	Position
Fairfield Materials Management	Ian Trippier	General manager
FareShare North West	Seb Serayat	Development manager
Feeding Manchester	Nona Ethington	Co-ordinator
Food Futures/Manchester Public Health	Colin Cox	Public health consultant
Kindling Trust	Helen Woodcock	
Kindling Trust	Nona Ethington	
Manchester City Council	Neil Jones	Environmental strategy officer
Manchester Fayre	Steve Southern	Senior facilities manager
Manchester Fayre	Kate Evans	Operations manager
New Smithfield Market	Jo Sclater	Wholesale & business services manager
New Smithfield Market	Kenneth Leah	Assistant wholesale market manager
Real Food Wythenshawe	Sarah Woolley	Community manager
Real Food Wythenshawe	Jacqueline Naraynsingh	Programme manager
Unicorn Grocery	Debbie Clarke	
	Debbie Ellen	Independent Research Consultant, author/co-author of several Manchester Food Reports

In addition:

Feeding Manchester Conference#13: Cracking Good Food – Adele Jordan; Manchester Food Cycle – Merlyn Taylor; Apples for Eggs – Vicky Swift; Sustainable Food Cities – Ben Reynolds; Village Greens Co-op, Prestwich – Denise McAvoy.

Appendix 4: Case studies

Food Futures

Food Futures is coordinated by Public Health Manchester. Based within Manchester City Council it is a broad partnership comprising public, private and third sector organisations and community groups. It was established in 2005 to promote all aspects of good quality food in Manchester by influencing policy on sustainable practice, supporting local/community food initiatives and developing food partnerships.

Its aims are to:

- improve the health of the people of Manchester
- protect the local and global environment
- strengthen the local economy
- build stronger and more sustainable communities
- promote culinary diversity and the enjoyment of good food across the city

Since inception it has gradually gained momentum, co-ordinating and supporting a series of successful initiatives. These include:

- **Growing Manchester**, which is now in its third year and currently supports around 20 community groups to grow their own food by providing the necessary help to get sites up and running.
- **Cooking Manchester**, a scheme designed support community cooking groups. Three community co-ordinators are employed to help set up schemes and recruit volunteers to assist and maintain momentum. Both the above schemes have been independently evaluated; these show they have been relatively successful in achieving their aims and in leaving a legacy to keep the initiative going.
- **Truly Good Food**, an accreditation scheme to promote healthy and sustainable eating in Manchester's cafes and restaurants.
- **FareShare Northwest**, a food waste diversion project at New Smithfield Market (see separate case study), which Food Futures supports.
- **Real Food Wythenshawe**, of which Food Futures is a partner.
- **Hulme Community Garden Centre**, a unique community-led inner-city horticultural project. It is a not-for-profit organisation with a mission to bring the community together through gardening.

Food Futures' vision is of a city with a culture of good food, where access to affordable fresh food will be at the heart of local communities. Local food production and distribution will be commonplace, supporting the local environment, health and improving neighbourliness and participation in the community. The public sector, private sector and communities will work in partnership to improve diet and nutrition in the city, and to reduce the environmental impact of the food consumed. Manchester will be a place where people choose a healthy and well-balanced diet; where people can enjoy a wide variety of food at its best, whether at home or eating out; and where food preparation is safe and hygienic wherever and whenever people eat.

Real Food Wythenshawe

The five-year Real Food Wythenshawe Project (RFW) began in September 2012 with £1million lottery funding and £200,000 match-funding. It has a programme manager and three other staff, with a focus on growing, cooking and education.

Wythenshawe was originally built as a Garden City with an emphasis on growing food; every garden was planted with a fruit tree, and it still has more green space than any other part of the city. The vision for RFW is to create a Garden City for the 21st century, maximising the potential of its abundant green spaces, giving local communities the opportunity to live more sustainable lifestyles, and establishing a more secure food future. The project is based upon a Partnership-working model, in which partners take responsibility for leading flagship projects.

Wythenshawe has high levels of deprivation. There has been a history of high unemployment and low educational attainment, resulting in a lack of opportunity for local people. 2011 Census data for Wythenshawe[87] indicates that its five Wards have a total population of 74,200, with 38% of households having no adult in employment (compared with the Manchester average of 36%). 44% of housing is owner-occupied. 44% of Wythenshawe residents are in very good health (compared to the Manchester average of 49%) and 9% have bad or very bad health (compared to the Manchester average of 7%). The demographic is slowly changing from predominantly white working class to around 38% non-white in 2011. There are approximately 47,000 jobs in Wythenshawe, only 5% of which go to Wythenshawe residents[88].

Access and availability of fresh food has declined over the past 20 years. Parades of shops previously occupied by grocery stores have been taken over primarily by fast-food/takeaway outlets. There are two major supermarkets in the area. This combination of factors has resulted in Wythenshawe being described as an urban food desert.

Food poverty – defined as the inability to obtain healthy affordable food – is a problem in Wythenshawe, as it is in other parts of the City. Access to healthy food is restricted due to a lack of suitable local shops and the associated problem of people getting to the ones that do exist. These are often small chain suppliers, such as Spar and Nisa, selling basic food at higher prices. This problem is compounded by a lack of knowledge about what constitutes a healthy diet and a lack of skills to create healthy meals. . It has been reported that, in one of the high schools, 75% of children receive a free school meal. There is a move to establish breakfast clubs as part of the school day. RFW recently set up four holiday breakfast hubs to address this, providing over 1,500 breakfasts in three weeks (though, with more publicity and time to organise it, they believe the figure would have been much higher). Eleven food-banks operate in the area and are working with FareShare North West to establish a local hub as part of RFW.

Cooking from scratch and loss of skills is an issue in Wythenshawe. To put the scale of the food problem into perspective, one adult did not recognise an onion during a cookery class run by RFW.

[87] Manchester City Council 2011 Census data for Wythenshawe. Available at: http://www.manchester.gov.uk/download/downloads/id/19809/q03e_2011_census_wythenshawe_srf_dashboard.

[88] Personal communication with Jacqueline Naraynsingh, project manager, Real Food Wythenshawe

Furthermore, meals made in class cannot be replicated in many homes as they cannot afford ingredients for a basic larder.

The RFW hopes to address the food-related problems in the area through a wide range of schemes, often involving food growing initiatives. In addition to seven allotment sites Wythenshawe has the following resources:

- Willow-Park Social Housing Group, a project lead, has identified 70 plots of land potentially available for growing, and the Group has 14,000 properties, all with gardens.
- Wythenshawe Park has three large greenhouses, each with capacity for 3,000 plants, worked by local volunteers. As the programme develops, it is intended that these will become a social enterprise training resource.
- Wythenshawe Park Farm covers an area of 270 acres. There is a Community Farm within the park, managed by a resident farmer as a community enterprise, with volunteers helping to run the farm that produces local beef, pork, lamb and eggs.
- The walled garden is used to develop micro-climate growing schemes.
- Rose Hill Community Farm in Northenden produces eggs and honey on a former allotment site.
- Manchester College, in partnership with RFW, has constructed a geo-dome, with students attending the college to house experimental and educational indoor growing systems, including hydroponics, aquaponics and wormeries
- A 'Meanwhile Strategy' enables currently unused land to be used for growing, until such a time as it is required for development. By planting in industrial-sized growing tubs, these can be forklifted to another site should the land be reclaimed.
- Raised beds are being planned on a site in Newall Green, initiated by a retired lady living in sheltered housing after she joined an organised trip to the Incredible Edible community growing initiative in Todmorden. Talks are also being held with Manchester Transport to set up edible Wythenshawe sites along the new metro line.

Other initiatives aimed at putting food back on the agenda include:

- Cooking sessions at the Wythenshawe Games, which fed around 600 people, provided recipe leaflets and gave away seeds from the growing area demonstration.
- Identification of 600 people interested in growing food;
- Identification of 27 kitchens from which to run community cookery classes;
- Engagement with allotment owners over the Wythenshawe Allotment Show, to showcase their produce;
- A Garden City Event, offering home-made soup and bread using food from FareShare;
- Work with Wythenshawe Market to run a series of cook and taste sessions using market produce;
- Engagement with a group of long-term male unemployed in Bideford interested in building raised beds in the area;
- Setting up of 'Farmacy' herb planting, after Thakers Pharmacy in Baguley suggested using its outlets to help promote the scheme. Thakers is also setting up and offering cooking sessions on the premises, advertised using prescription bags;

- Working with primary schools to establish growing schemes;
- Working with 'Sure Start' schemes to promote healthy eating; and
- Working with coaches from Manchester United Foundation, developing a resource pack - 'something to chew on' - using footballers as a model for diet (children make a player sandwich named after one of team).

There are high expectations for the Real Food Wythenshawe project, given the level of funding, and care has been taken to provide assurance that the money will be invested wisely. The initial emphasis has focused on understanding the Wythenshawe infrastructure and meeting with, and winning the support of, key people, including community members. The project expects to engage the services of over 150 cooking ambassadors and 2000 people engaged in 'hands on sessions' over its lifetime. The response to RFW has been very positive, with over 60 volunteers signing up within the first 4 months.

FareShare North West

FareShare North West is based at New Smithfield Market. It is part of a network of 18 UK depots and is run by EMERGE, an environmental charity and Social Enterprise. FareShare North West focuses on reducing food waste and alleviating food poverty by redistributing surplus food, and that with damaged packaging, to deprived communities in Greater Manchester and the North West. Food is donated by companies such as Greggs, Brakes, Gerber, Robert Wiseman, Nestlé, and Kellogg's, while fresh fruit and vegetables are captured from traders on NSM and from local farmers.

FareShare North West handles around 300 tonnes of ambient and chilled food annually. It generally only redistributes in-date food and, as a result, around 30 tonnes could not be used last year. Volunteers sort food and redistribute it to community food members (CFMs) – schools, food banks, community centres and sheltered accommodation – and also groups who support vulnerable people such as the homeless and refugees. Two vans make between 15 and 20 deliveries a day, and the whole operation costs in the region of £130,000 per year to run.

By working directly with farmers in West Lancashire to capture unwanted produce, FareShare North West has also been accessing vegetables. Between June and October 2013 16 tonnes of cauliflowers, cabbages and lettuce have been gleaned by volunteers from 2 farms in West Lancashire. There is considerable potential to capture more of this food and establish links with other farmers in the area. There is limited chilled storage at the warehouse, so redistributing it all before it deteriorates is a challenge. Further investment is required to maximise the amount of food that can be redistributed. FareShare North West plans to establish a kitchen so that fresh food can be processed, meaning more food that would be wasted will be available to be eaten by people.

FareShare currently employs two people and one apprentice. It also relies on 25 volunteers, with between five and eight working each day. FareShare North West runs a structured volunteering programme currently funded through New Deal for Local Communities (NDLC) This is an eight-week training course, run quarterly. Each cohort of 10 participants have carbon literacy training as part of the programme and also , receive food hygiene training which is essential for working in the warehouse.

Kindling Trust

The Kindling Trust is a not-for-profit social enterprise run by a small group of dedicated, entrepreneurial individuals. They have produced a number of reports on the sustainable food agenda (with a strong focus on organic and fairness in the food supply chain) and are pioneering a series of initiatives across the city. These include:

- Land Army, which provides volunteer support for local organic growers, especially during busy periods. In return, volunteers learn about commercial organic farming.
- Farm Start, which helps new growers learn how to grow on a commercial scale. They farm organic land, rented from Abbey Leys for one year. If successful, they then take on another parcel of land, enabling them to increase their holding incrementally this way over four years, after which they should be ready to move to their own farms. A £400 annual programme fee contributes towards capital costs, training and seeds. This scheme is the first of its type in the UK and acts as a bridge between volunteering through the Land Army and becoming a viable commercial grower.
- Feeding Manchester, which is an information and discussion forum, bringing food practitioners across Greater Manchester together to explore ways creating a more sustainable food system for Manchester, and visioning Greater Manchester as a sustainable food city. The Feeding Manchester website provides information about buying, growing, cooking and eating local fresh produce.
- The Kindling Trust helped to set up and continues to work with Manchester Veg People, an independent multi-stakeholder co-operative of local organic growers and buyers (caterers, restaurants and public sector institutions) working together to provide high quality fresh, seasonal food. Produce is sourced within 50 miles of Manchester city centre and is picked to order the day before delivery. Growers work together, sharing skills, knowledge and resources to ensure buyers get the best range and quality of produce. This approach helps to reduce waste and spreads risk. Pricing reflects the true costs of creating a better, fairer food system. Other food initiatives promoted by the Kindling Trust:
    - Growers: Abbey Leys Farm; Farm Start; Glebelands City Growers; Libby Flintoff (Brook House Farm); Moss Brook Growers; Organic Dan; and
    - Buyers: 63 Degrees; Aumbry; Bean and Brush; Café Muse; Café Rylands; Chorlton Green Brasserie; Common; Eighth Day; Green Plate; Pokusevski Deli; Salford Museum and Art Gallery Café; The Brew Boat Company; The Marble Arch; The Parlour; The Yard; Trove; University of Manchester - Food in Residence; University of Manchester - Food on Campus.
- Other Kindling Trust projects include:
    - Forgotten Fields – a cross-generational project looking at the region's food heritage.
    - The Big Dig - part of a nationwide project aiming to involve people in community food-growing.
    - Sustainable Fayre - a project exploring opportunities to increase 'low-carbon' food in Greater Manchester via school meals.
    - A package exploring opportunities to increase 'low-carbon' food in Greater Manchester via school meals and other public sector institutions.

Manchester Fayre (MCC school meals service)

Manchester Fayre is the Council's catering service, supplying meals primarily for schools, but also day centres and other organisations. Gross income is around £12million. Its food budget is £6.4million, £6 million of which is for school meals, across 140 primary schools and 8 secondary/academies. It provides 22,000 meals daily and over 5 million annually.

The school meals service operates on a cost neutral basis, which determines the price (£2.26) of a two-course school meal (though schools can set their own selling price to parents). Fifty per cent of all children receive free school meals, and the Council has a statutory requirement to provide these. Manchester Fayre is in the top 5% uptake nationally for school meals, providing 15% more than the national average at primary schools and 20% more at secondary level. According to the Kindling Trust report, 51 primary schools run breakfast clubs in the MCC area[89]. Within the Association of Greater Manchester Authorities Manchester Fayre is the most expensive provider but has the largest uptake.

Considerable work has gone into providing tasty, balanced, nutritious meals. Menus change twice a year to reflect the season: wraps and salad in summer and warming dishes in the winter. They cater for special dietary requirements. They are also working towards attaining Food for Life Accreditation[90] Bronze Award, and as part of this process are currently engaged in procuring organic eggs (though organic food otherwise doesn't feature). Meat is procured under the British Farm Standard 'Red Tractor'. As part of future tender documents, potential suppliers will be required to include their green credentials.

Manchester Fayre has recently launched a food waste recycling service, resulting in dramatic increases in recycling rates. Food previously accounted for over half of Manchester's school waste but now, with the help of pupils, teachers and school catering staff, over 50 tonnes a month is now sorted, separated and composted.

The Kindling Trust report[91] provides a compelling case for public catering services to engage with the concept of sustainable food; two of their seven recommendations have already been implemented:

1. To carry out a full carbon audit of Manchester Fayre's food purchases and put in place ongoing carbon monitoring; and
2. Sustainable Fayre should immediately set out to refine the school menus to be more sustainable and strengthen its whole school approach (it is understood that a low-carbon menu has now been implemented).

89 The Kindling Trust, 2011. Sustainable Fayre Study. Retrieved from www.kindling.org.uk/sustainable-fayre-study

90 The Food for Life Partnership is a network of schools and communities across England committed to transforming food culture. Their aim is to reach out through schools to give communities access to seasonal, local and organic food, and to the skills they need to cook and grow fresh food.)

91 The Kindling Trust, 2011. Sustainable Fayre Study. Retrieved from www.kindling.org.uk/sustainable-fayre-study

Unicorn Grocery

Unicorn Grocery is a food co-operative based in Chorlton. 90% of seasonal UK fruit and vegetables is sourced directly from UK farms which are either organic or in conversion. An ethical/values-led philosophy is central to the business and underpins all decision-making, with provenance, sustainability and quality being critical factors. It currently has 50 members and around 12 employees, with a policy of equal pay and rights for equal contribution.

Unicorn works closely with its local and regional growers on crop choice and planning, the relationship being one of mutual benefit and respect. This helps spread risk between grower and retailer.

Delivery is either by road (for UK and European suppliers) or is shipped; nothing is air freighted, and delivery vehicles are generally full. Produce is purchased in quantities that will sell, and that justify transport costs, thereby providing a genuine competitive alternative to the big supermarkets. Items such as cereals, grains and pulses are bought in bulk and re-packaged on-site into saleable quantities, allowing Unicorn to create its own product mixes. The vast majority of fruit and vegetables are sold unpackaged.

Unicorn is “food-waste averse”. It avoids over-ordering and re-processes surplus food in the on-site deli. Damaged or badly misshapen food is offered to customers free of charge. Any food that may still go to waste is then given to FareShare NW.

Unicorn has a very good relationship with its customers, many of whom share its values. Customers are encouraged to learn as well as buy, and free recipe leaflets are available in store to help them get the best out of their produce. Customer surveys enable Unicorn to listen to and act on feedback.

Unicorn is a business success story. Since it opened in 1996, annual sales have grown to around £5million, with growth for this year projected to be 15%. Wages are equivalent to 18% of sales, with profit margins being around 28%. Whilst Unicorn does not intend to expand to new stores, it is keen to help other fledgling co-operatives, and has a ‘Grow a Grocery’ section of its website dedicated to this process. Unicorn’s customer base is diverse, and its model is about making good food affordable to a wide range of people; its prices compare well against the supermarkets, and Unicorn believes that an important factor in its replicability is having a local population of people who cook, because the store is primarily ingredients-based. Whilst, some interviewees questioned whether the model would work in some of the more deprived areas, Debbie Clarke from Unicorn had the following response:

“Our business model is based on making good food affordable to a wide range of people, with prices that are competitive with the supermarkets. Our customer base is very diverse and we serve a radius of approximately two miles, which includes Whalley Range, Old Trafford and Hulme as well as Chorlton. Chorlton wasn't so affluent when we opened (high level of renting including many students, and the parade of shops opposite us that is now full of bars and independent shops contained a chippy and little else) and yet we thrived from the outset, with growth higher than predicted from the word go. I'm not saying Chorlton was deprived, and I'm not guaranteeing that our model would work just anywhere but I don't think it's an accurate assessment that our success has relied upon us being in an affluent location.

"We'd say the critical factors have been a high population density, the fact Chorlton always had a decent district centre, and crucially, enough people who want to cook. There are plenty of not so affluent communities in Manchester where that is still the case."

Other schemes – overview

Below are examples of successful sustainable food initiatives in Manchester. The list is by no means exhaustive but illustrates the variety of schemes in operation. All were mentioned by interviewees as evidence of the good work, commitment, innovation, knowledge, skills and practice that is helping put local sustainable food on the agenda for the people of Manchester.

- **Glebelands City Growers –** a 3-acre organic urban farm, selling all their produce within 5 miles. It has three employees on around minimum wage, working 30 hours/week (though in reality they work much more than this). Volunteers are recruited through the Kindling Trust's Land Army scheme. Glebelands provides training and work opportunities for volunteers and offers educational visits to schools, designed to raise awareness and understanding of sustainable food production. Compost is produced on site with additional input from Fairfield Composting. Between January and December 2012 the farm produced a total of ~8,000kg of vegetables.
- **Cracking Good Food** - a social enterprise cookery school and community cooking network, promoting cooking from scratch using sustainable and seasonal ingredients. The emphasis is on running hands-on, value-for-money sessions for the general public, community groups and vulnerable and disadvantaged groups, with participants preparing, cooking and eating together. They have worked with over 40 different community groups to date. They also run demonstrations at festivals, bespoke events for companies and conferences and wild-food foraging workshops. They employ 2 full-time and several part-time staff - including cooking coordinators, chefs and administrative staff – and around 100 volunteers.
- **Moss-side Community Allotments** - runs several plots, worked by local volunteers. Everyone is welcome, and contributors receive a share of the produce, which is largely organic.
- **Hulme Community Garden Centre** - a community-led inner-city volunteer & education hub promoting horticultural & sustainability issues. Operating as an award-winning retail garden centre and nursery, it is a not-for-profit organisation whose mission is to bring the community together through organic gardening. They work with socially excluded people across Greater Manchester. Each year they work with over 200 community organisations, providing over 3,000 volunteering, training and workshop opportunities. They developed Manchester's first public green roof and recently built a straw bale eco-classroom. Established in 2000 they now have over 15,000 visitors per year.
- **Debdale Eco Centre** - provides workshops and courses for primary schools and others on composting and food growing using organic principles. They also provide corporate volunteering and away-day opportunities and a consultancy service.
- **Ridgeway Street Community Garden** - operated by the Manchester Environmental Resource Centre initiative (MERCi), the project promotes gardening and has a wildlife area and vegetable plot.
- **Rose Hill Community Farm & Garden** - a community-led project to regenerate a disused allotment site into a community recreational, education and food growing/rearing facility. The core aims are improving health and wellbeing, improved employment prospects,

greater access to an attractive local environment - especially for the disadvantaged - and greater biodiversity.

- **Growing Manchester** - run by Food Futures to support and train new and existing community food growing projects.
- **Didsbury Dinners** - a community interest company establishing new community gardens and orchards and teaching people to cook affordable, sustainable and healthy meals. Proceeds from their cookbook, 'Didsbury Dinners: The Low-Carbon Community Cookbook' are invested in local sustainable food projects.
- **Bite** - a Partnership between MIND and Manchester Health and Social Care Trust to improve health and wellbeing through growing, cooking and eating. They run nine growing projects, an affordable veg bag scheme and five cafes, with food sourced from their own allotments.
- **North Manchester General Hospital** - a horticultural project attached to the mental health unit, where plants are grown for the hospital grounds and for sale to patients and the public. They have two large poly-tunnels.
- **Abundance Manchester** - a voluntary project redistributing surplus or unwanted fruit and vegetables from gardens, allotments and public trees to local groups and communities. They have their own Abundance allotment and look after Kenworthy Community Orchard in Chorlton.
- **Herbie** - a mobile greengrocer set up by MERCi, providing affordable fresh fruit and vegetables to those in East Manchester. It also supplies to schools and works with sheltered housing, churches, health clinics and resident groups to ensure the food reaches as many people as possible. Herbie hopes to act as an inspirational model for other communities.
- **Manchester Food & Drink Festival** – taking place over as much of the City Centre and surrounding districts as possible, with themes including healthy eating and local produce.
- **Abbey Hey Primary School** - operates a market stall each Friday on the school playground, staffed by children from the school's Eco Committee, selling to local families and parents picking up their children from school.
- **Dig Box Scheme** - a South Manchester-based home delivery scheme supplying locally-grown organic vegetables and fruit and other local produce, bought at a fair price. Their aim is to minimise food miles and packaging.
- **Yummie Mummies** - based at Old Moat Children's Centre in Withington, helping parents to learn about cooking and nutrition during lunchtime cook and eat drop in sessions.

Appendix 5: Overview of community growing schemes and allotments in Greater Manchester

Manchester community growing schemes†

Community growing scheme	Location	Project	Estimated reach	Project description
Real Food Wythenshawe	Wythenshawe	Wythenshawe Campus - Manchester College	7000*	This project will see the development of a closed loop bio-system to showcase modern indoor growing techniques and demonstrate what sustainable food production can mean in an urban setting. The system has been designed by award winning Manchester-based cooperative, URBED, who specialise in design, sustainability and community engagement. It will be located in the College's centre for sustainability and will build on The Manchester College's commitment to sustainability. Once opened, it will be a resource for the local people of Wythenshawe; school and community tours of the facility will be at its heart, and the system will become a major educational resource for the area.
Real Food Wythenshawe	Wythenshawe	Willow Park & Parkway Green Housing Trust	3400*	This project will see Willow Park and Parkway Green Housing Trusts focus on helping Wythenshawe residents to grow food in their own gardens through a programme of awareness raising and engagement. The project will also look to bring into use the large number of 'no man's lands' that exist between properties in Wythenshawe, utilising the land for growing food.
Real Food Wythenshawe	Wythenshawe	Wythenshawe Park Walled Garden		This project will develop a hub for community growing, training and skills development through a horticulture centre and possible 'veg box' scheme. This project will be delivered by Manchester City Council Adult Social Care and BITE.
Wythenshawe Community Farm	Wythenshawe		3280	Wythenshawe Community Farm is a registered Charity established in 1984. It is located in the heart of Greater Manchester and is the only working farm in South Manchester. Wythenshawe Community Farm was set up by local people on the site of Sharston School rural studies area and moved to Wythenshawe Park in 1998. The idea was-and-still-is-that the farm could help the local area by 'providing an enjoyable and interesting place for people to come and visit'. Giving everyone a chance to see and learn about a traditional working farm. Visitors from all sections of the community, singly or in groups, are welcome to visit the farm free of charge.
Leaf Street	Hulme	Leaf Street, Hulme	25*	Community garden for local residents

Community growing scheme	Location	Project	Estimated reach	Project description
Horticulture Project North Manchester General Hospital	Crumpsall M8 5RB		25	A horticultural project providing therapy for 20-30 clients with enduring mental health needs. Plants are sold at competitive prices to hospital staff and the general public; also supply Manchester City Council with plants to distribute to In-Bloom Projects across the city and supply and fit brackets, baskets and planters to order. Garden now has pond installed by rockery. 1st prize for most environmentally friendly garden in Manchester 3 years running; 2nd prize for best community garden.
Heaton Park Animal Centre				
Ridgeway Street Community Garden	Miles Platting	Ridgeway Street	1496.3*	Ridgeway Street Community Garden is located in East Manchester in Miles Platting. It was established in spring 2001 and is supported and maintained by members of the local community. It aims to create a healthy outdoor space that is a focus for the whole community and can be used to promote natural gardening methods and foster communication skills and co-operation with children and young people. There are environmental arts projects, gardening workshops, events and outings organised via the community garden. MERCI(the centre for sustainable development) is two minutes away.
Rosehill Community Farm and Garden	Sharston / Northenden	Rosehill Community Farm	2152.5*	This is a community led and supported innovative project to regenerate a disused allotment site and wasteland into a much needed, environmentally friendly open access recreational, education and training facility for the community. The core aims of the project are simple but highly effective, improving the health and well being of the community, better access to education and training for improved employment prospects, greater access to a much improved and attractive local environment especially for the disadvantaged within the community and a more diverse and sustainable wildlife population.
Debdale	Gorton	Debdale Eco-Centre	3605.5*	Based in Gorton, Debdale Eco Centre is a not-for-profit environmental organisation working across Greater Manchester to promote composting, organic growing and sustainable living. The project provides workshops teaching all aspects of home composting and food growing using organic principles. Training area has a polytunnel and willow dome (accessible by wheelchair) with tea and coffee making facilities - small charge to cover costs.

Community growing scheme	Location	Project	Estimated reach	Project description
Fallowfield Secret Garden	Fallowfield	Fallowfield Secret Community Garden	50	City south has donated some of their wasteland to be transformed into a community garden. They have chosen a local City South tenant Mark Roberts to manage and run this project. With some funding secured, and the potential for more, the work is now underway. We hope to launch the secret garden in the spring of 2012. The aim is to create a space for as many local people as possible to grow their own food, herbs, flowers trees and eventually, build a community. By sharing the skills and knowledge of permaculture, we will promote sustainable living in Fallowfield.
Platt fields Park	Community garden	Platt Fields Park	50	Community groups have growing space in Platt fields Park
Hulme	Community garden	Hulme	50	Hulme residents community growing
Silver Service, M20 2XF	Didsbury West	Growing Manchester	10	
MCC, M20 1HQ	Old Moat	Growing Manchester	8	
MMU, Highfield Road, Levenshulme, M19 3LL	Gorton South	Growing Manchester	Not known	
Great Places, Withington, M20 3JJ	Old Moat	Growing Manchester	12	
Manchester Abundance, Chorlton, M21 7WH	Chorlton Park	Growing Manchester	20	
Santuary Housing, M11 2LY	Bradford	Growing Manchester	8-10	

Community growing scheme	Location	Project	Estimated reach	Project description
Orchard49" - OTAGs Community Orchard	Warwick Court, Old Trafford, Seymour Grove allotments	Old Trafford Amateur Gardeners' Society	n/a	The Orchard is on an urban allotment site in Old Trafford, on a previously hard to let plot (plot 49) which had become very overgrown. Old Trafford Amateur Gardeners' Society decided to create a community orchard which would showcase local heritage varieties and provide an opportunity for local people to learn about growing fruit. The orchard is being developed with a grant from the Big Lottery Fund Local Food scheme and is a long term project.
Community garden on Ossery Street	Moss Side		n/a	n/a
Horticultural Project, North Manchester General Hospital	Crumpsall	Manchester Mental Health Partnership	20-30	An horticultural project providing therapy for 20-30 clients with enduring mental health needs. Plants are sold at competitive prices to hospital staff and the general public; also supply Manchester City Council with plants to distribute to In-Bloom Projects across the city and supply and fit brackets, baskets and planters to order. Garden now has pond installed by rockery. 1st prize for most environmentally friendly garden in Manchester 3 years running; 2nd prize for best community garden. Targeted at 20-30 clients, but open to public.

* assumes 10% of potential target group engage somehow

† This is not a comprehensive list, and there may other sites that we are unaware of, but is intended to give an indication of the scale of community food growing in Manchester

Manchester City Council allotment sites

Site name	Site address	Total no. of Plots
Bethnall Drive	Bethnall Green Allotments	32
Ackroyd Avenue	Abbey Hey - Ackroyd Avenue, M18 8TL	117
Frenchbarn Lane	Blackley - Frenchbarn Lane, M9 6PB	62
Edge Lane	Bradford - Edge Lane, M43 6BA	88
Crumpsall and Cheetham Hoddeston St	Cheetham, Hazelbottom Road, M8 0GQ	113
Ivy Green Road	Chorlton - Edwards Avenue, M21 9ET	95
Scott Ave	Chorlton - Scott Avenue, M21 9QW	71
Cleveleys Ave	Chorlton - Cleveleys Avenue, M21 8TS	80
Hough End	Chorlton - Mauldeth Road, M21 7TH	14
Southern	Chorlton - Wintermans Road, M21 7GE	114
Philips Park	Clayton - Philips Park, M11 4DJ	17
Bradley Fold	Didsbury - Ford Lane, M20 2RU	129
Wellingtom Road, Old Moat	Fallowfield - Wellington Road , M14 6FA	31
Brailsford Road	Fallowfield - Brailsford Road, M14 6PT	10
Fallowfield	Fallowfield - Caxton Road, M14 6EE	65
Cypress St/ Pleasant St	Harpurhey - Cypress Street, M9 5XZ	29
Aquarius Estate	Hulme - Crediton Close,M15 6EW	4
Acorn Close	Levenshulme - Acorn Close, M19 2HS	19
Caythorpe Street	Moss Side - Caythorpe Street, M14 4UD	12
Ossory Street	Moss Side - Great Western Street, M14 4BX	11
Hazeldine Road	Moston - Hazeldene Road, M40 3GL	31
Bluestone Road	Moston - Bluestone Road, M40 9JD	33
Crowden Road	Moston - Crowden Road, M40 5RW	13

Site name	Site address	Total no. of Plots
Broadhurst Park	Moston - Joyce Street, M40 5HH	20
Yew Tree / Northern Moor	Stortford Drive Northenden	61
Lamb pitts, Holyway	Northenden - Ford Lane, M20 2RU	47
Brighton Gove	Rusholme - Brighton Grove, M14 5JR	79
Abbotsford Road	Whalley Range - Abbotsford Road, M21 0RJ	15
Alexandra Rd South Allotments	Whalley Range - Alexandra Road South, M16 8GH	28
Albermarle	Withington - Minehead Avenue, M20 1FW	119
Levenshulme	Highfield Road Gorton South	228
Ryder Brow	Gorton South	29
Scotland Hall Road	Miles Platting and Newton Heath	9
Sharston	Chaffinch Road Sharston	41
Tonbridge Road	Levenshulme	103
Woodhouse Park	Maismore Road Woodhouse Park	108
Brooklands	Clover Croft Brooklands	23
Baguley Hall	Glebelands Road Bagueley	58
Foxfield Road	Foxfield Road Baguley	42
Gorton Hort	Debdale Park Gorton North	115

Total beneficiaries of grow-your-own schemes

Beneficiaries	Total
Total no. of people benefitting from community gardens:	≥21,220
Total no. of people benefitting from allotments:	9,260
Total population of Manchester:	503,127
% of Manchester's population benefitting from grow-your-own:	≥6%