

## Urban agriculture, planning and health; exploring the links

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**Abstract:** *Emerging public health and planning policy literature, suggests that urban agriculture can support the development of 'healthier urban environments'. Whilst the policy literature highlights the links, to what extent is this explored in academic literature in the field? This review aims to gain an understanding of the academic literature which explores the links between planning, health and urban agriculture. As an example of multifunctional land use, with cross cutting activities and benefits, it is difficult to create distinct themes for urban agriculture. However, the review highlighted three themes emerging from this field of work. The first explores the land use potential and its capacity for urban agriculture and its intersection with planning. The second explores the role of urban agriculture within wider 'food systems planning', whilst the third theme highlights its potential contribution to the development of 'healthier urban environments'.*

**Keywords:** *Urban Agriculture, planning, health, food systems, healthy urban environment*

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### Overview

The last decade has seen urban agriculture (UA) expand across cities of the globe (Mougeot 2005). UA is defined as 'an industry located within (intra-urban) or on the fringe (peri-urban) of a town, a city or a metropolis, which grows and raises, processes and distributes a diversity of food and non-food products' (Mougeot 2000:10). UA manifests in diverse forms, from allotment gardening, rooftops, windowsills, to community gardening and food production schemes (Gorgolewski, Komisar and Nasr 2011; Guitart, Pickering and Byrne 2012). Broad objectives, range from policy driven to civil society led approaches, informal or 'illegal' guerrilla

gardening (Adams and Hardman 2014; Martin and Marsden 1999).

Most UA literature focuses on the global south, examining issues of food security, nutrition, and management of informal practice (Danso and Eriksen-Hamel 2010; Viljoen and Bohn 2012). Focus on the global north is dominated by established North American movements (Cohen and Reynolds 2014; Taylor and Lovell 2012). Fewer examples span Australia, Northern Europe, UK, where allotments and 'community gardens' proliferate (Mason and Knowd 2012; La Rosa et al. 2014; Guitart, Pickering and Byrne 2012). Thematically, UA literature in the global north reflects wide perspectives and

manifestations (Mok et al 2014). Themes cover food security, nutrition, community, education, health benefits, sustainable development and innovative planning (Corrigan 2011; Tornaghi 2014; Feenstra 2002; Bell and Cerulli 2012; Davis and Middleton 2012; Armstrong 2000; Schmutz et al 2014; Viljoen 2005). UA emerges in master-planning and mapping of land use potential for post-industrial cities such as Detroit (Giordia 2012; Martellozzo et al 2014). Links to food systems planning and healthy urban environment feature (Morgan 2014; Kent, Thompson and Jalaludin 2011).

It is not within scope to examine evidence of health *benefits* of UA, although this underlies the literature review. Literature exploring UA's health benefits cite nutrition, exercise, wellbeing and community resilience (Armstrong 2000; Van den Berg 2010; Wakefield et al 2007; Teig et al 2009; Schmutz et al 2014; Pretty et al 2011; Zick et al 2013). Criticisms of studies of health benefits of natural environment are applicable to this field, citing lack of longitudinal study, small samples, use of already healthy participants, and lack of experimental research techniques (Park et al 2011). This, coupled with *anecdotal* evidence using facilitators as opposed to participants, makes it hard to evidence causal links (Armstrong 2000; Park et al 2011).

Whilst emerging themes in global north indicate the 'multifunctional' nature of UA, associated academic literature lacks critical analysis, mainly focusing on promotional narrative accounts (Deelstra, Boyd and Van den Biggelaar 2001;

Tornaghi 2014). An emerging literature calls for critical analysis of underlying interpretation, value, claims and efficacy (Tornaghi 2014; Wang, Qiu and Swallow 2014; Kneafsey et al 2008, McClintock 2013; Ernwein 2014; McCormack 2010). A danger, with rising food poverty, is that uncritical approaches to UA entrenches 'neo-liberal' structures, detracting from systems change and 'rights based' thinking (McClintock 2013; Dowler and O'Connor 2012; Dowler and Caraher 2003).

### **Literature review**

Emerging public health and planning policy literature, suggests UA can support development of 'healthier urban environments' (Twiss et al 2003, Kent, Thompson and Jalaudin 2011; Chang and Ross 2012; Ross and Chang 2014).

This review aims to gain an understanding of the academic literature exploring the links between *planning*, *health* and *UA*.

Whilst policy interest sees UA as a route to healthier urban environments, to what extent does the current UA literature generate understanding of this field?

### *Search strategy*

Literature selection took place by searching electronic databases (Summon - Birmingham City University, Web of Science), with 'Boolean Operators', alongside 'Google Scholar', literature reviews and reference 'snowballing' (Table 1). While not a full systematic analysis of all literature, the search attempted a methodical approach, coupled with critical appraisal (using CASP - Critical Appraisal Skills Programme).

**Table 1: Use of Boolean operators to generate search**

Below summarises Boolean search terms used.

'Health* place*' OR 'health* urban plan*' OR 'healthy communit*' OR 'healthy urban environment*' OR 'healthy built environment' OR 'health* space' OR 'health* city' OR 'neighbour* plan* health*' OR 'spatial plan*' OR 'public health and planning' AND 'deprived', 'low income', 'poverty'	AND	'Urban agricult*' OR 'urban food growing' OR 'urban cultivation' OR 'urban garden*' OR 'urban farm*' OR 'urban food product*' OR 'community agricult*' OR 'community food growing' OR 'community cultivation' OR 'community garden*' OR 'community farm*' OR 'community food product*' OR 'city agricult*' OR 'city food growing' OR 'city cultivation' OR 'city garden*' OR 'city farm*' OR 'city food product*' OR 'peri-urban food growing'	AND	'Food system' OR 'foodscape' OR 'healthy food' OR 'healthy eating' AND 'obes*' OR 'physical activity' OR 'food system' AND 'public health'
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**Table 2: Literature inclusion and exclusion criteria**

The following inclusion and exclusion criteria were used.

Inclusion	Exclusion
<p>All research study designs considered including qualitative and quantitative analysis</p> <ul style="list-style-type: none"> <li>• Journal articles</li> <li>• Study had to have been completed and published results</li> <li>• English Language</li> <li>• Material from 1999 to present day initially, then narrowed down</li> <li>• Literature from the global north</li> </ul>	<ul style="list-style-type: none"> <li>• Material from developing world or 'South'.</li> <li>• Non English language papers</li> <li>• Non-academic literature</li> </ul>

Initially, search terms brought up unmanageable 'hits'. Many were not relevant and did not include the full terms in key words, showing terms not relevant to the topic. This could be scanned

relatively quickly. An example of the search process can be seen below, indicating how the topic was refined so as to produce manageable results.

**Table 3: Literature search results**

Database	Search results	Key words	Notes
Search 1 Science Direct	Search results: 49,670 results found	(urban agriculture OR community gardening OR urban food grow*) AND (planning OR health).	Unmanageable. Too wide. Initial scan to identify relevant papers.
Search 2 Science Direct	search results: 6,099 results found	pub-date > 1998 and 'urban agricult*' OR 'urban food growing' OR 'urban cultivation' OR 'urban garden*' OR 'urban farm*' OR 'urban food product*' OR 'community agricult*' OR 'community food	Some relevant articles with many not relevant. Search results ranked in order of relevance, and found only within first few pages of search results, after which no literature was found.

		<p>growing' OR          'community cultivation' OR          'community garden*' OR          'community farm*' OR          'community food product*' OR          'city agricult*' OR          'city food growing' OR          'city cultivation' OR          'city garden*' OR          'city farm*' OR          'city food product*' OR          'peri-urban food growing' AND          'health* place*' OR          'health* urban plan*' OR          'healthy communit*' OR          'healthy urban environment*' OR          'health* space' OR          'health* city' OR          'neighbour* plan* health*' AND          'obes*' OR 'physical activity' OR 'food system' AND 'public health'.</p>	
Science Direct	5,280 results found for	<p>('health* place*' OR          'health* urban plan*' OR          'healthy communit*' OR          'healthy urban environment*' OR          'healthy built environment' OR          'health* space' OR          'health* city' OR          'neighbour* plan* health*' OR          'spatial plan*' OR          'public health and planning' ) and          ('urban agricult*' OR          'urban food growing' OR          'urban cultivation' OR</p>	Relevant articles extracted. Many not relevant to the topic.

		'urban garden*' OR 'urban farm*' OR 'urban food product*' OR 'community agricult*' OR 'community food growing' OR 'community cultivation' OR 'community garden*' OR 'community farm*'	
Science Direct	2,281 results found	pub-date > 2009 and ('urban agricult*' OR 'urban food growing' OR 'urban cultivation' OR 'urban garden*' OR 'urban farm*' OR 'urban food product*' OR 'community agricult*' OR 'community food growing' OR 'community cultivation' OR 'community garden*' OR 'community farm*' OR 'co) and ('health* place*' OR 'health* urban plan*' OR 'healthy communit*'	Relevant articles extracted, many not relevant, and repeats on previous search
Science Direct	49,690 results found for	(urban agriculture OR community gardening OR urban food grow*) and (planning OR health).	550 were examined, relevant articles extracted. Majority not relevant subject matter.
SUMMON	309 results	Limited search terms 'urban agric*' OR 'community garden*' OR 'food growing' AND 'healthy urban	Relevant articles extracted

		environment*' OR 'healthy built environment*' or 'public health planning' AND 'physical activity' AND 'healthy eating' OR 'obesity' AND 'deprived'	
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### Emergent themes

Three themes emerged from the literature explored (summarised in Table 4 below)

**Table 4: Appearance of themes in the literature**

	<b>Theme 1: Exploring land use potential</b>	<b>Theme 2: Food systems planning</b>	<b>Theme 3: Healthy urban environments</b>
Barton (2009)			✓
Dalton et al (2013)			✓
Grewal and Grewal (2012)	✓		
Haberman et al (2012)	✓		
Kent and Thompson (2012)			✓
Kent, Thompson and Jalaudin (2011)			✓
La Rosa et al (2014)		✓	
Martellozzo et al (2014)	✓		
Martin and Marsden (1999)		✓	
McClintock, Cooper and Khandeshi (2013)	✓		
Mendes (2008)	✓		
Morgan (2014)	✓		✓
Port and Moos (2014)	✓		
Rydin et al (2012)			✓
Sonnio (2009)		✓	
Taylor and Lovell (2008)	✓		

Van Leeuwen et al (2010)		✓	
Viljoen and Bohn (2005)		✓	
Walton (2014)			✓

*Theme 1: Exploring land use potential*

Links between UA, planning and health, focus on the interest in land use production potential, mainly in North America.

Concerns raised including food shortage, improved food access, obesity, diet related illness, and climate change posit UA among the solutions for northern cities (Grewal and Grewal 2012).

Practical and theoretical studies emerge across fields of planning, geography, legal and crop science disciplines. Focus on identification and capacity of urban land space for productive use, supported by mapping tools- GIS, aerial imaging, and Google Earth-enables land to be identified (McClintock, Cooper and Khandeshi 2013; Port and Moos 2014). Statistical data, census information, records on food production and consumption, support the development of quantitative analyses and theoretical understanding of productive capacity (Martellozzo et al 2014, Mendes 2008; Grewal and Grewal 2012; Haberman et al 2014).

Martellozzo et al (2014) quantitative analysis of *global* urban land constraint explored ability to meet urban vegetable demand. Data-sets developed on recommended vegetable consumption, enabled estimation of land need and production potential. Haberman and colleagues (2014) developed this, exploring land potential in Montreal, Canada, using scenarios of vacant space, roof tops, consumption needs and productive potential. Grewal and Grewal (2012) developed self-reliance scenarios

(Cleveland, U.S.) linking crop yield data and intake recommendations for percentages of land use, including vacant lots, concluding the possibility of significant levels of self-reliance.

McClintock, Cooper and Khandeshi (2013) used GIS mapping of vacant land potential in Oakland, California, linking *recommended* consumption levels of fresh produce, and potential productivity.

Through ‘action-research’ academics and activists, advocated land mapping tools enhancing work with urban municipalities. Taylor and Lovell’s (2012) high resolution Google Earth images mapped Chicago’s public and private spaces of food production, highlighting unquantified private domestic gardens. Mendes and colleagues (2008) advocated land inventories of Portland and Vancouver (Canada) in enhancing development of UA policy. Port and Moos (2014) explore suburban land within Waterloo, Ontario (Canada), identifying influence of planning models in shaping neighbourhoods, thus influencing land potential.

While these studies advocate UA’s potential for food production, policy-driving and influencing planning development, they have limitations. Most express optimism that production could be increased using identified land parcels (Grewal and Grewal 2012; McClintock, Cooper and Khandeshi 2013). Broad brushstroke assessments, ‘from above’ cannot factor complexities ‘on the ground’. Urban land is subject to variable conditions including contamination and



accessibility. The studies do not analyse logistics of regenerating derelict land. Much land has an industrial history, is vacant for a reason and challenging to regenerate (De Sousa 2003). Can it be feasible that such land would produce enough to address the health and nutrition issues that UA proposes to solve?

An underlying assumption is that UA is a *good thing*, and should be embraced by citizens, and planners. There is little consideration of the fiercely competitive nature of urban land use, complex ownership patterns, democratic planning processes, or realities of diverse resident's choices for alternative activity. Time, knowledge and resources needed for food growing are high. How large levels of urban food production are to be achieved, and who is going to do the work is not considered. Ethically, many people living in deprived neighbourhoods are time and cash poor, suffering a burden of poor health that makes capacity building slow (Davis and Middleton 2012).

### *Theme 2: Food systems planning*

A growing agenda under the 'food systems planning' banner, involves cross-disciplinary civil society groups, public health, planners and urban designers, highlighting issues of food poverty, local, healthy and sustainable food (Morgan 2014). Pothukuchi and Kaufman (2000), surveying 22 U.S. cities, highlight barriers to inclusion of food within planning agendas. Things have developed significantly. Embraced within food systems planning, UA is now seen at the forefront of moves reforming 'zoning' in US cities for productive land use (Maloney 2013). UK based literature has explored policy restraints of incorporating food growing into planning (Martin and Marsden 1999; Howe 2010). Pioneered in North America, 'Food Charters' have been central to food

systems planning. Taking account of multifaceted nature of food, they argue for 'whole systems' approaches to planning healthier food, involving civil society, public health, and planners (Morgan 2013; Carey 2013; Hayhurst 2013). These documents providing a mandate and focus for action envisage UA as an integral part of food systems (Hardman and Larkham 2014; Sonnio 2009; Block et al 2012). In Detroit, competing visions of UA for a major city plan, have food systems at its heart (Giordia 2012).

Whilst emerging literature focuses on governance, planning and collaborative working of urban 'foodscapes', UA literature is not central to this debate. The literature on food systems planning and food poverty, comes from a critical geography, public health emphasis, embracing the politics of food more critically (Sonnio 2009). It is 'real world', focusing on a 'rights based' agenda more than predominantly descriptive and promotional UA literature (Dowler and O'Connor 2012; Dowler and Caraher 2003). In a sense, UA is 'travelling along with' wider food systems debate, with a gap in the UA literature between critical thinking and reality about what UA can achieve.

What distinguishes UA according to Morgan (2014) is its 'visceral materiality, the fact that it is palpable, tangible and above all *visible*' (p.11). UA serves an important 'symbolic' function, capturing interest in food issues, through its practical nature. Realities of UA's contribution to food systems provisioning are little explored, as are meanings that people derive from and approach food growing with in a wider food system. Through local food, people may manage anxieties about the food system they inhabit (Kneafsey et al 2008). Perhaps an unreal sense of

security, as Born and Purcell (2006) highlight pitfalls of localism's emphasis as 'local trap', whilst Flint and Taylor (2007) argue 'local' cannot be seen in isolation from global political systems. Critical analysis is needed to assess claims of UA in practice. Is 'local food' and UA really a sustainable and realistic option for ensuring a level of food justice when faced with market failure?

Linking food and planning agendas, architects, Viljoen and Bohn (2005, 2014) envision innovative approaches to urban food systems design through *Continuous Productive Urban Landscapes*. This integrates UA into urban landscapes planning, bringing food back into cityscape. Others posit 'multifunctional' benefits of UA to food and health within a city, as a strategy for its adoption (Van Leeuwen, Nijkamp and Vaz 2010; La Rosa et al 2014). Again, how these systems will be adopted in practice, who will do the 'work' of them is underexplored. Is it possible to develop systems in deprived neighbourhoods, how will supporting policy and governance develop, what are the conditions for success or failure of such experiments in a climate of austerity? Analysis is needed of UA's role within food systems planning debate, with critical appraisal of practice in real-world settings. There is a lack of evidence about 'scaling up' UA to meet viable levels of food production. The complex politics of race, class and gender within this movement, raised by some, and its impact on deprived neighbourhoods are only beginning to be explored (Draus, Roddy and McDuffie 2014).

### *Theme 3: Healthy urban environments*

A third theme arises; 'healthy urban environments' within public health and planning literature, partly influenced by policy, such as WHO Healthy Cities

(WHO 2009). Links between lived and built environments and determinants of health are explored, highlighting opportunities for collaborative working between public health, planners, civil-society to create healthier urban settings (Morgan 2009).

UA features within the literature on healthy urban environments, cited as examples of *multifunction* exemplifying 'people and place' relationship-incorporating land use planning, healthy activity, and community. A systematic literature review, by University of New South Wales (Healthy Built Environment Programme) explores links between health and the built environment (Kent, Thompson and Jalaludin 2011). Grouping evidence into three areas -physical activity, connecting and strengthening communities, healthy food choices (p1.0), UA features as an example linked to healthy food and physical activity.

Theoretically, the focus on healthy built environment links to 'ecological' public health, building on complexity theory, incorporating non-linear pathways found in nature and human behaviour (Lang 2012; Morgan 2014). Kent and Thompson (2012) examine this emerging approach, mentioning food growing examples, describing how interventions need examination across multiple levels, tailored to people and place. This requires collaborative relationships between public health, planners, communities, with shared learning and experimentation. They suggest public health needs a tangible role in working with planning, calling for case studies illustrating collaborative working. Rydin and colleagues (2012) describe the Lancet Commission's findings (2009-11) linking health and built environment. Again, ecologically-oriented complexity thinking enables understanding of

pathways involved in intervention to develop healthy place. UA features as a 'prospective' case study in this context, with examples given from Detroit, to explore the possibility in practice. Barton (2009) outlines a model for examining the determinants of health, including built environment, again using food growing to exemplify activity crossing interrelating domains affecting health. A UK example of the literature explores interventions of the 'healthy towns' programmes, with community gardening cited as an example (Dalton et al 2013). Finally, Walton (2014) uses qualitative interviews with residents of Madison, WI, to develop conception of 'vital places within neighbourhoods, which support pathways to health through social interaction. Access to healthy food is cited as one of the themes and the role of community gardens as 'vital places' within built environments is recognised.

Although UA appears through this literature as potential examples, there is no in depth analysis of how such interventions might have worked in practice, and what they can bring to learning in the field. As the literature focuses on the work of healthy built environments, UA is mentioned 'in passing'. There is need for a more dedicated look at the intersection of UA within this field.

### **Research potential**

Although the theory and practice of UA can offer valuable insights into links between health and planning, overall there is lack of literature exploring how this could happen. A perception that UA can provide answers to the issues, lacks critical analysis about conditions needed to bring such ideas into action. A number of questions arise which could be explored: How in practice is derelict land space turned into productive land and what is the

role of community and policy makers in this process? Is UA capable of meeting ambitious food production targets or is this wishful thinking? Is UA merely a symbol for lack of control in a global system? Where are the innovative case studies of UA and food being used to bring healthy urban environments into reality? Can UA illustrate the pitfalls, challenges and realities of collaborative working processes, reflexive learning, and evaluation espoused within literature on healthy built environments and ecological public health? Is there a disjunction between those who adopt UA from a policy perspective, with the aspirations of civil society groups? What could complexity thinking offer in an analysis of UA? How might this all work in a world of austerity? What conditions and processes are needed for UA getting off the ground? Should and could UA be 'upscaled'? The literature has helped to focus the themes emerging which explore the links between urban agriculture, planning and health, and to highlight areas for further exploration.

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