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URBAN AGRICULTURE AND A PLANNING APPROACH TO URBAN FOOD SYSTEMS

Stephanie White and Michael W. Hamm

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CITY FOOD SYSTEMS IN A RAPIDLY URBANIZING WORLD

This paper discusses ways to support city food systems in the context of rapidly changing social, physical and ecological environments so that urban and peri-urban populations maintain and improve access to safe and nutritious food. Because access to food is more problematic for those who are socially and structurally disempowered, and because they have fewer income-earning opportunities open to them, interventions that improve social standing, strengthen social networks, and enable access to decision-makers and other resources, can not only improve food security but also fundamentally change the structural factors that reproduce poverty and marginalization (Battersby-Lennard & Haysom, 2012; Gallaher et al., 2013; Slater, 2001; Twyman & Slater, 2005; WinklerPrins & deSouza, 2005). To address this social and structural marginalization in cities, we advocate for integrated and inclusive planning practices, and suggest three main focus areas where innovation might be introduced and scaled:

1. **Livelihood and Income:** Following Hekkert et al. (2007) we recognize that "the presence of active entrepreneurs is a first and prime indication of the performance of an innovation system" (p. 422). Specifically we recognize the critical role of informal livelihoods in urban and peri-urban food provisioning, and make suggestions for better addressing the needs of the sector, as well as working with entrepreneurs to introduce and scale innovative technologies.

2. **Infrastructure and Markets:** Traditional markets are central to economic and social life in African cities, and are critical to creating safe and widespread food access. The informal food economy will remain critical for most people in cities well into the future, but informal markets have not been well-supported and lack infrastructure that provides a safe and clean environment and services that might be useful to entrepreneurs. Access to improved infrastructure and services can create better conditions for food exchange and provisioning, and thus enable improved food security.

3. **Resilient Supply Chains:** A focus on sustainability and resilience in supply chains results in different decisions than a focus on efficiency and/or competitiveness. The principles of resilience, which focus on reducing risk and vulnerability, call for attention and support to multiple food sourcing strategies, a valuing of redundancy in the system, and wide access to information about sources of food. Such characteristics in supply chains go against the conventional norms of efficiency and centralization, which have been important to the development of supermarkets in the global north, and instead favor supply chains that are able to respond to food needs with agility.

In addition, per the request of USAID, we pay special attention to the role of urban agriculture (UA) in urban food systems. Our discussion of urban agriculture provides an illustrative example of an urban food-based livelihood, and highlights the importance of understanding food exchange

and provisioning strategies in relation to an individual's capabilities and entitlements.[1]

RECOGNIZING AND CONFRONTING GROWING URBAN FOOD INSECURITY

Researchers at the African Food Security Urban Network (AFSUN) refer to urban food insecurity as an 'invisible crisis' due to its growing, but unaddressed, prevalence in African cities (Crush & Frayne, 2010). In an eleven city survey, conducted in eight Southern African Development Community (SADC) countries, researchers found that as Africa urbanizes, and as urban poverty increases, there is a corresponding growth in urban food insecurity.[2] "The food security challenges facing the urban poor," AFSUN researchers assert, "and the factors that directly or inadvertently enable or constrain urban food supply, access, distribution and consumption, can no longer be wished away or marginalized" (p. 6).

In African cities, food provisioning and exchange is carried out largely by the improvisational and self-directed activities of urban populations. In contrast to the global north, where food access is concentrated in supermarkets, household food provisioning in the global south takes place through a dynamic mix of market and non-market sources (agriculture and livestock production) and there is a heavy reliance on the informal food economy for both livelihood and food security, especially by the urban poor (Battersby, 2012; Battersby & Crush, 2014; Crush & Frayne, 2011). Though the supermarket segment of the food economy is growing throughout sub-Saharan Africa, research by Tschirley et al. (2013) projects that the informal food economy (sometimes referred to as the 'traditional food sector') will remain the primary source of food for urban populations well into the future.

Urban food security is primarily an issue of *access* and is highly influenced by city infrastructure, flows of people and energy, demographics, and policies (Battersby-Lennard & Haysom, 2012; Battersby, 2011, 2012; Battersby & Crush, 2014; Crush & Caesar, 2014; Crush & Frayne, 2011; Kent & Thompson, 2014; Reel & Badger, 2014).[3] Municipal governments, with their purview over city resources and infrastructure development, are uniquely positioned to bring more deliberative and contextually-informed support to urban food provisioning and exchange (Frayne et al., 2010).[4] In practical terms, more deliberative and contextual approaches in East African urban food systems are operationalized through (1) grounded, empirical research that can be used by municipal governments in planning, (2) participatory and inclusive planning methods that elicit challenges, opportunities and needs from those engaged in food-based livelihoods, and (3) interventions that address food security in relation to the urban physical, social and economic environment.

Most municipal governments do not have food security policies, and understandings of how food

[1] Using the language of Amartya Sen's capabilities approach draws attention to the idea that an individual's access to food in cities is a function of a broad range of factors related to an individual's ability to achieve well-being in ways that they themselves define, i.e. their 'substantive freedoms.' (Sen, 1990)

[2] SADC countries include Angola, Botswana, Democratic Republic of the Congo, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia, Zimbabwe.

[3] In this paper, the term 'food security' is reflective of the broad consensus in international development that food security is a multi-dimensional phenomenon that is comprised of three basic entitlements (to use the language of Amartya Sen): utilization, access, and availability. In urban areas, *access* to food is the primary concern, and may be influenced by any combination of spatial, social, and economic factors.

[4] According to Hekkert et al. (2007), "In order to make technological change sustainable, technical change alone is not sufficient. Changes in the social dimension–such as user practices, regulation, and industrial networks–are inevitable…Both science and policy community recognize ever increasingly that technological change and its resulting innovations are best understood as the outcome of innovation systems… If we knew what kind of activities foster or hamper innovation–thus, how innovation systems function–we would be able to intentionally shape innovation processes" (p. 414).

insecurity occurs and how it differentially affects city residents is not well understood (Frayne et al., 2010). Working with city governments to encourage inclusive and deliberative strategic planning is therefore a *process innovation* that can have a positive effect on enabling the creation and scaling of more targeted innovation in food provisioning and exchange systems. It is expected that such process innovation, which is broadly applicable (or *scalable*) to cities in the global south, will be important to the introduction or development of any particular *technological innovation.* Technological innovation refers to specific interventions, e.g., policy, a specific product or artifact. The evolution and diffusion of technological innovation is contingent on the influence of a wide variety of factors, including societal structures, economic and social conditions, power relationships, and policies that comprise the food system (Hekkert & Negro, 2009; Hekkert et al., 2007).[5]

URBAN AGRICULTURE

This section discusses the value of conceptualizing urban agriculture *in relation* to other city food provisioning practices. A consideration of urban agriculture within its social and economic contexts can provide a more nuanced and useful understanding of its contributions to food security than accounts that focus exclusively on productive output. Though our analysis focuses on urban agriculture, the lessons that emerge are more broadly applicable to other components of the food system.

Urban agriculture (UA) and peri-urban agriculture (PUA) are persistent features of cities everywhere. In the developing world, UA and PUA often occur informally and opportunistically, in the 'in-between spaces' of towns and cities. Recently, urban agriculture has received an enormous amount of interest from development organizations, specifically in relation to improving urban food security and income-generation for the poorest urban residents. However, several authors have urged caution towards this generally celebratory view of UA[6] based on a number of urban realities: (1) poor people do not often have access, or only insecure access, to productive resources in an urban environment; (2) municipal officials are often antagonistic towards urban agriculture for a number of reasons (e.g. issues of hygiene and safe food production and debates over the proper use of city space), and, therefore, the livelihood of urban cultivators is always tenuous; (3) besides leafy greens, in terms of the overall food share, urban agriculture produces very little, and (4) urban food insecurity is due not to a lack of food, but the inability to *access* food. Thus, there is a good argument to be made that an exclusive focus on urban agriculture wrongly construes food *availability* as the primary concern, when a more enlightened approach would focus on the factors that prevent people from *accessing* food, which, as noted above, are economic, spatial, political, and social (Battersby, 2012a; Crush, Frayne, & Pendleton, 2012; Crush, Hovorka, & Tevera, 2011; Crush, Hovorka, & Tevera, 2010; Ellis & Sumberg, 1998; Satterthwaite, McGranahan, & Tacoli, 2010; Webb, 2011). In addition, an over-reliance on urban agriculture as a measure for improving food security risks relieving city officials of their duties to respond to the needs of the most marginalized urban residents by paying attention to and addressing urban processes that hinder people and their abilities to access food (Rakodi, 1985; Hovorka, 2006).

Such cautions are important because not only do they temper the expectations that often

[5] Hekkert et al.'s 2007, 2009 papers discuss the qualities that distinguish *innovation systems.* They are helpful in understanding the multi-dimensional aspects of innovation, and what is required to allow and encourage the generation of innovation. GCFSI considers this conceptualization of innovation as a touchstone for food systems work.

[6] Examples of publications that promote a largely celebratory view of urban agriculture are Egziabher (1994), Koc (Ed.) (1999), and Mougeot (2006).

surround UA and argue for a measured and empirically-substantiated approach to UA advocacy that links UA to urban social and economic factors, but they also compel a more complicated and grounded understanding of African urban food environments. Such cautions are important because they not only temper the lofty expectations that often surround UA, but because they argue for a measured and empirically-substantiated approach to UA advocacy that links UA to other social and economic factors. Additionally, understanding UA as part of a complex social and economic system within cities, compels researchers to produce more complicated and grounded understandings of African food environments.

Urban Agriculture as an Urban Process

The apparent minimal contribution of urban agriculture to urban food security is an important consideration, but it does not mean that UA is unimportant.[7] Urban agriculture *can* be leveraged toward improved food security but doing so requires understanding obstacles and opportunities in the context of food systems. The ways in which people experience food systems are highly variable and depend on a range of factors, such as spatial location, political and economic dynamics at multiple scales, livelihood, gender, socioeconomic status, and age, among others. As Crush et al. (2011) note, without such an understanding, there is a real danger that a focus on *availability* through increased production that dominates rural development will be uncritically adopted in urban areas. Already, they note, there is an "emerging focus on the 'technical' aspects of urban farming and how these can be supported and enhanced through strategic interventions such as the promotion and adoption of innovative and appropriate urban farming technologies… [and] strengthening of market chains including creation of farmers' markets, linking farmer and consumer organizations, support to creation of small-scale preservation and storage facilities; and supporting the growth and activities of urban farmer organizations" (p. 298-299). While not necessarily wrong, supporting urban agriculture vis-à-vis

Urban and Peri-urban Agriculture: *For the sake of simplicity, UA and PUA are collectively referred to as UA. Peri-urban agriculture generally refers to agriculture that takes place on the outskirts of a town or city, but what counts as UA or PUA is fluid. As cities grow, the particular factors that influence how UA is practiced will change and will be contingent on how the environment 'urbanizes.' In general, it may be helpful to think of UA as a distinctly urban livelihood (rather than a misplaced rural livelihood) that takes shape as a result of the environment in which it is found. This means that urban cultivators integrate and shape their production and exchange practices in ways contingent on urban processes, as well as personal preferences. For example, in order to distribute their produce, city farmers may develop relationships with multiple and diverse agents of distribution, and, as a result, may be able to access various types of markets. As an informal urban livelihood, it may be one income-generating activity among several in which the cultivator engages. In addition, as a practice that integrates with the environment, urban cultivators may often use urban natural resources, such as compost from city dumps or nutrient-rich (but, bacteria-laden) effluent, as productive inputs.*

[7] To clarify, 'minimal' in this case refers to overall food quantities produced by urban agriculture. The contributions of urban agriculture to a city are widely variable, and its individual contributions to any one person or household ranges from very small to critically significant. The use of the word 'minimal' here is meant to further the argument that attention to urban food *systems* must move beyond urban agriculture since it is only one aspect of food provisioning and exchange.

technical interventions *in the absence of* understanding the social dynamics that impede access to food is problematic and not likely to yield transformative change or sustainable food security.

What is required, rather, is attention to agricultural production *and* the social, economic, and ecological dimensions of food provisioning *in relation to* each other, which can enable analyses that embed UA within the larger food environment. Such a perspective helps to move UA beyond simplistic advocacy efforts that present its main value in materialistic terms, and reframes it as a *social process* that is characterized and influenced by the same issues that make surviving the city challenging. In the following sections, a number of frames are presented that can help to 'unpack' urban agriculture in order to better understand how it integrates with other urban processes.

Gender and Women in Urban Agriculture

UA is often framed in ways that draw attention to the importance of women in urban food production. However, as Hovorka (2006) and Crush et al. (2011) point out, this is not the same as understanding the underlying factors that may cause women to take up urban agriculture in the first place, and whether or not their participation represents a desperate measure of survival or an emancipatory measure of self-reliance. A number of authors caution against assuming that farming always produces positive outcomes for women and suggest that unless UA is accompanied by an emancipatory agenda, urban agriculture projects targeted at women may serve only to reproduce the conditions that limit their opportunities and, thus, perpetuate their oppression (Hovorka, 2005, 2006; Rakodi, 1985). As Hovorka et al. (2009) note, "women are in the majority among urban farmers around the world, but they tend to predominate in subsistence farming, whereas men play a greater role in urban food production for commercial purposes" (p. 5). An emancipatory agenda, for example, might seek to improve the commercial opportunities for women by leveraging and improving their existing skills in the subsistence sector or addressing prejudicial land tenure laws.[8]

Hovorka (2006) explores some of the ways in which urban agriculture can enable political and social empowerment of women. For example, one subsistence chicken producer was able to take advantage of a government program that allocated land for chicken production and enrolled in courses in agricultural production at the Botswana College of Agriculture. As a result, she expanded her production and eventually began earning an income that allotted her a space in the middle-income bracket of her city. Accordingly, Gallaher et al. (2013) further demonstrate how sack gardening improved social capital, especially if carried out collectively, which enabled a measure of resistance to food insecurity by poor women in the Kibera slums of Nairobi.[9]

[8] For more examples of how UA can serve an emancipatory agenda, see Hovorka (2006).

[9] As noted by a USAID reviewer, a future research agenda might include attention to women's and men's differential access to land and inputs in urban areas, the variability in what is raised, variability in relation to income and who benefits from urban agriculture, how women and men 'fit' UA into a larger urban livelihood strategy, and the ways in which women and men are differentially connected to markets and who those markets serve.

Food Systems: *A conventional definition of food systems conceives of them as a set of activities involving food, from production to consumption. Ericksen (2008) suggests that a broader definition that draws attention to the political, social, and environmental dimensions of food systems is required, since food systems are embedded within societies and environments and are, thus, shaped by political, social, and ecological factors. Therefore, she proposes a definition of food systems that includes:*

- *The relationships between and within social and ecological environments that comprise food provisioning processes and practices, as well as the practices themselves;*
- *The results produced by these processes and practices on social and ecological environments, such as improved food security, pollution, and social welfare, including economic development;*
- *Other determinants of food security (stemming from the interactions in bullet one).*

Figure 1 provides a conceptual model for thinking about how food systems develop and the various factors that shape them. Activities are driven by or conditioned by factors in the socioeconomic and ecological environment. Those activities, in turn, produce socioeconomic and environmental feedbacks that affect the drivers of food systems.

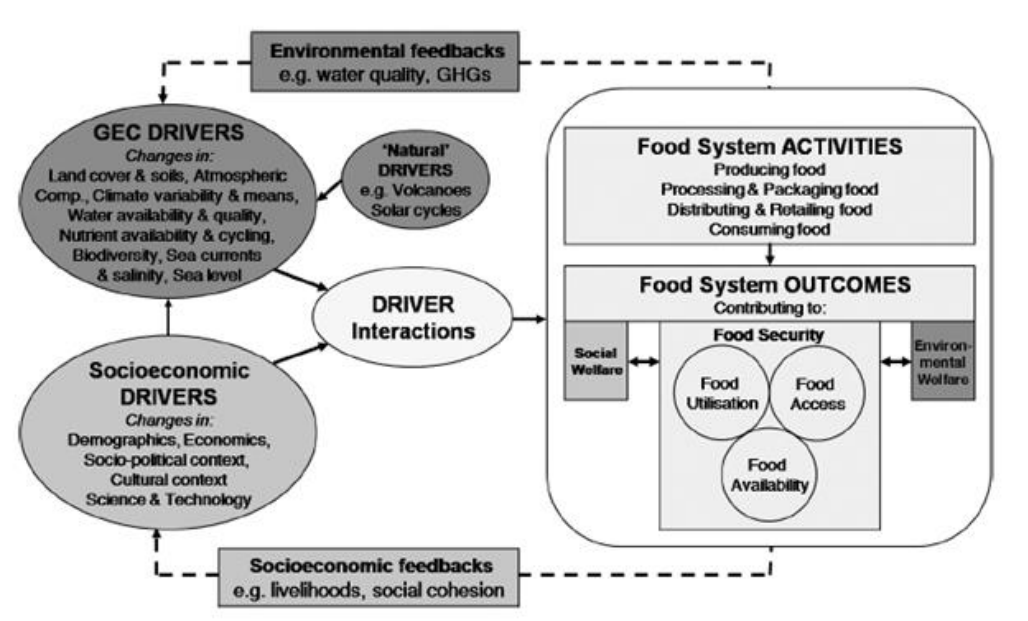

Figure 1: Food system model. Source: Ericksen et al. (2010). The value of a food system approach. In Food Security and Global Environmental Change. [Ingram, J., P. Ericksen, and D. Liverman (eds.)]. Earthscan, London, UK, 25-45.

Such a definition compels attention to, for example, gender relationships, infrastructure, policies and practices that determine the quality of food, and policies or other relationships that govern production and exchange practices within the urban environment. Such a definition also compels addressing factors at multiple scales, such as national and international policies that govern trade, and across space, such as rural-urban transfers or the location of urban markets.

The Heterogeneity of Urban Agriculture Mirrors the Heterogeneity of African Cities

In African cities, people typically pursue multiple livelihoods (Owusu, 2007), and farming for income or food is one livelihood that can be practiced in association with other livelihoods. How one practices, and what one grows, is contingent on a range of factors, which will determine how a cultivator can benefit: the location of the cultivated space, other obligations, market demand (which is seasonally, socially and spatially contingent), access to inputs (the poorer one is, the more difficult it is to access inputs, land, and information), social connections, and many other factors. People may grow on plots within, or in close proximity to, the home, on public or private land (Ellis & Sumberg, 1998). To a great extent, urban farming is done on land that has not yet been developed, or which cannot be developed due to various environmental concerns, such as recurrent flooding. Farmers very often do not have legal access to the land they work on, and as a result, access to urban agriculture as a livelihood is often precarious and limited (Crush et al., 2011). In other cases, farmers may make arrangements with landowners or public institutions to farm vacant portions of land parcels or on parcels of land that have yet to be developed. Limited access to water may prevent year-round cultivation activities. Where one cultivates may raise associated public health or land-tenure issues, both of which are potentially important to policymakers and planners.

Though recent work shows that urban agriculture is not as widely practiced, nor as important to food security as it is sometimes portrayed (Battersby, 2011, 2012a; Crush et al., 2012; Crush et al., 2011; Crush & Frayne, 2011), it is important to realize that there is wide variation among cities. In some places, UA appears to be critical to mitigating food insecurity, even if it does not solve it. The following table demonstrates that variation among eleven cities, as well as shows that in cities where individual rural-urban food transfers are more important, urban agriculture tends to be less important. Rural-urban food transfers refers to the private exchange of food between individual households and represents an important source of food, especially among the food insecure (Frayne et al., 2010):

Urban agriculture and rural-urban food transfers (% of households)		
	Urban agriculture	**Rural-urban transfers of food**
Windhoek	3	72
Gaborone	5	70
Msunduzi	30	15
Johannesburg	8	24
Cape Town	4	14
Manzini	9	53
Maseru	47	49
Blantyre	63	38
Harare	60	37
Maputo	22	23
Lusaka	3	39

Table 1: *Urban agriculture and rural-urban food transfers (% of households) (Crush et al., 2012)*

In part, this wide variability across cities illustrates the need to understand the conditions that exist in various cities that prompt people to rely on some food-provisioning strategies and not

others. In addition, once city planners know and understand the value of various food-provisioning strategies in terms of livelihood and food security, they can apply this knowledge to city development and/or food security plans.

Variability of urban agriculture is also the result of the objectives of farmers. Webb (1998) notes most studies of urban agriculture mention urban crops in only the most cursory manner and, therefore, miss a critical dimension of the ways in which cultivators ascribe importance to particular plants, and how they strategize and plan production or distribute their time and effort. To remedy such an oversight, Webb developed an index to analyze the relative importance of various crops to household diets, the monetary value of those crops, and how the savings achieved by home growing was diverted to other household needs. The index revealed the underlying reasons for growing particular plants, which were not always related to economic issues, but were nonetheless important to urban cultivators and helped to understand how they navigate urban conditions.[10]

The Impact of Global Processes on City Food Provisioning

Most studies of urban agriculture do not theorize or address how urban food provisioning is affected by global processes, though these processes are critically important to understand as city food systems become increasingly affected by global economic and environmental dynamics. For example, the prevalence of urban agriculture appears to increase in times of economic distress, such as those created by structural adjustment, which has caused a large-scale 'informalization' of urban economies (Hansen & Vaa, 2004; Maxwell, 1995; Owusu, 2007; Page, 2002). Battersby-Lennard and Haysom (2012) argue that urban food production may be important to dealing with the effects of economic uncertainty, financialization of commodity markets, and climate change, especially for the urban poor. They suggest that preserving and protecting agricultural land in close proximity to the city is preferential to land development that is more conventionally urban.[11] Such perspectives draw attention to the ways in which use of urban space is eminently political and tied to factors in the global political economy. Thus, the pattern to emerge from the research is that urban agriculture is conditioned by city processes in diverse ways.[12] These city processes are not spatially confined to the geographic borders surrounding the city. Similarly, who benefits most from urban agriculture varies widely, and is contingent on a range of factors that include social location, availability of land, access to land, personal relationships, individual initiative, etc. The reasons people engage in urban agriculture, as well as the reasons underlying food security, will have explanations that lay well outside the spatial borders of the city.

Re-Evaluating the Relationship between Food Security and Urban Agriculture

A primary take-away from this section is that "urban food security is not, and has never been, simply an issue of how much food is produced" (Frayne et al., 2010). Amartya Sen pointed this out thirty years ago via the capabilities approach, which linked food security to an individual's *positive freedoms*, or their ability to effect change in their lives. One might wonder, then, why even talk

[10] The use of this index was not observed in any of the other reviewed literature. It was quite a novel and revealing study and is recommended as one starting point in better understanding urban food systems (Webb, 1998). Potentially, use of such an index could be adapted for use in determining what crops are of local importance, what urban crops could be scaled up for sale or targeted for extension efforts, and what crops are differentially important to men and women.

[11] An excellent, rigorous study and highly recommended: (Battersby-Lennard & Haysom, 2012)

[12] Urban agriculture is "conditioned by" city processes; that is, it emerges in conjunction with them, so that agriculture in an urban environment is a *city* process rather than a rural process, misplaced. Urban agriculture is *urban*; it is an 'articulation' of the city.

about urban agriculture in relation to food security? Perhaps there are better and higher-use values for the urban space that better promote the positive freedoms of society as a whole and/or economic growth, so that urban agriculture warrants little attention and little advocacy. Urban agriculture can indeed play a role in creating improved food security; however, it will work differently based on the urban environment and the particularities of one's individual situation. This becomes clearer when urban agriculture is considered *in the context* of city food systems. In such food environments, where access to food is quite uncertain and constantly changing, more sources of food provide a higher degree of food resiliency.[13]

Food security can be conceptualized as a dynamic process or a continuum, along which households are constantly moving according to numerous variables, such as season or employment status of household members. That is, there are degrees to which households are food insecure, as well as different factors among and between households that shape food insecurity. There is strong evidence that UA can move people along the continuum to improved food security, though it may not necessarily wholly eliminate food insecurity (Battersby-Lennard & Haysom, 2012; Gallaher et al., 2013). For example, in their study of the Philippi Horticultural area of Cape Town, South Africa, Battersby-Lennard and Haysom (2012) found that though many of the families who worked for or bought food from Philippi could still be considered food insecure, their food insecurity status would be more dire had they not had this source of food. At an aggregate level, commercial urban food production can help moderate prices of imported fresh food (Battersby-Lennard & Haysom, 2012). Additionally, in part because urban agriculture has a comparative advantage over rural production of some crops, it can be a disproportionate provider of some foods, especially perishable, high quality items such as leafy greens, poultry, eggs, and milk (A. Hovorka et al., 2009).

Urban agriculture is one food-provisioning practice, among many, occurring within complex and idiosyncratic urban food provisioning systems that helps to reduce the severity of household food insecurity. It also represents a claim to urban space that can be disproportionately beneficial to poorer urban residents. What is produced *can* be critically important to urban residents in terms of income and food. But, as a process that is intertwined with other urban processes, including other components of the food system, it also has social and political dimensions that are important to understanding the structural and spatial dimensions of food security. As such, including the widespread practice of urban agriculture in analyses of food insecurity can provide insight into the factors that cause people to farm the city and into how food systems are failing or succeeding. In other words, in addition to investigating the instrumental aspects of urban agriculture and how they can be strengthened to support the food needs of urban residents, research could use urban agriculture as an entry point for understanding wider food provisioning issues.

AN URBAN PLANNING RESEARCH AGENDA: MAKING SENSE OF URBAN FOOD SYSTEMS

Well-functioning urban food systems are an important part of enabling citizen well-being and cities that work. Despite this, food concerns do not generally occupy a spot on the agendas of urban

[13] There is a large and growing body of literature on resiliency and vulnerability, though not much of it has been applied to understanding food provisioning systems, yet. The conceptual frameworks of resiliency and vulnerability offer a way for better understanding how people experience their food environments, how they work to make them better, what vulnerabilities exist on the horizon, and direction for how to support and enable resilient and sustainable food systems. We return to the concept of resiliency in the final section, and apply it to supply chains.

planners or municipal officials in the global north or south,[14] and much of the research on African food systems has been limited to economic analyses and the set of activities that get food from farm to bowl, i.e., growing, processing, transporting, and marketing. While such analyses are important, they do not give a thorough and grounded sense of how people negotiate food environments day-to-day, especially in relation to the 'Traditional Market Sector,' and how, over space and time, they leverage both informal and formal markets to their advantage.[15] As a result, the particular efficiencies and deficiencies of the various markets are not well-known, and it is unclear how informal and formal markets might work in tandem (rather than in competition) to mitigate urban food insecurity (Battersby, 2011).

As explained in the last section, city socioeconomic environments are comprised of people with widely varying social, economic, and spatial positions who have differentiated access to various food provisioning strategies; thus, the spatial and infrastructural dimensions of cities affect, to varying degrees, the ways in which people access food. For example, open air food markets, which once played an important civic role in cities of the global north, remain central to urban economic, social, and cultural life in the global south. Their location and design can have a major impact on how they are used and who is able to benefit from them. In a study of spontaneous vs. planned markets in Cali, Colombia, Ray Bromley (1980) found that the reasons a city government erects a market are quite different from the reasons that consumers and vendors use a market. Municipalities, he says, prefer market buildings because they are generally viewed as being more sanitary and aesthetically pleasing. In addition, they allow governments to regulate food and collect taxes from vendors. But, often, decision-making that proceeds at the municipal level neglects the interests of both traders and consumers. Without an understanding of community needs and preferences, markets can fail and, thus, represent a missed opportunity for enhancing the urban civic and economic environment.

The addition of supermarkets to urban spaces is seen as one way to offer lower prices and higher quality on a range of products. However, one effect of supermarkets in the global north has been to centralize food access, which has resulted in the evolution of 'food deserts.' In the process of deciding where to locate, supermarket developers, unsurprisingly, use models to determine what locations offer the best profit maximizing potential (Battersbury, 2012a). Such locations do not generally benefit the urban poor, who are often severely limited in their ability to travel or cannot afford regular trips on public transportation. Though consumers might pay higher prices at small neighborhood shops than they would at a supermarket, small neighborhood shops offer at least two advantages over supermarkets in addition to their convenient location: (1) they regularly offer credit to their patrons, and (2) they sell things in much smaller quantities than supermarkets. This second point is of critical importance to urban consumers who typically must buy small quantities of food on a daily basis because of small incomes and lack of, or unreliable, electricity and/or refrigeration to preserve food for longer periods of time.

[14] This is quickly changing in some places in the Global North. In the US, for example, the American Planning Association has developed policy statements and approaches to including food in planning work (http://www.planning.org/nationalcenters/health/food.htm), while a number of local and state governments have instituted food policy councils. (http://www.planning.org/nationalcenters/health/briefingpapers/foodcouncils.htm).

[15] In the decentralized food production and exchange environments of the Global South, the informal food sector plays a critical role in the urban economy, as well as in urban food security, and many people engage in food-related livelihoods to earn a living. For example, a survey conducted in 11 cities throughout southern Africa showed that 70% of households obtained their food from informal sources, with 31% doing so on a daily basis, higher than for any other food source (Frayne et al., 2010).

As noted earlier, *access* to food is more of a problem than overall *availability*, which draws attention to the role of poverty in food security (Crush et al., 2012; Frayne et al., 2010). However, it is important not to view access and availability independently of each other because there may be interactions between the two that exacerbate food insecurity problems for some people. For example, urbanization is rapidly removing farmland from production, which threatens overall availability of healthy, accessible food. In many areas, food production occurs in cities or within very close proximity to urban areas. Because urban planning and development approaches generally do not consider food production as a concern or objective, this food production capacity may become severely constrained as urbanization proceeds.[16]

As highly decentralized operations, urban food systems in East African cities occupy larger proportions of urban space and economic activity than northern food systems. One characteristic of such highly decentralized and popularly-produced food systems is that the business of food production, processing, and exchange is highly visible. Many households produce their own food, open-air slaughter and butchering of meat and fish is common, and livestock freely wander the streets. Without proper disposal systems, centers of food exchange and processing can generate significant health concerns. As cities grow, practices that once were sufficient or innocuous may become increasingly problematic. On the other hand, city food production can fulfill important cultural goals, and via urban agriculture, can provide urban greenspace.

Lastly, increasing resource scarcity and climate change will have effects on the ways in which cities and individuals provision themselves in the future. Modern food systems, which are highly energy intensive and rely on cheap inputs of oil, may be incompatible with what Kevin Morgan and Roberta Sonnino (2010) call the "new food equation", which has taken shape "in response to burgeoning prices for basic foodstuffs and growing concerns about the security and sustainability of the agri-food system" (p. 209).

CONCLUSIONS

There are several main points in this report:

The conditions affecting *urban* food access, availability and utilization are considerably different and are more variable than conditions affecting rural food security. This means that analyses and interventions must be particular to urban settings. Recognizing that urban food security is a multi-dimensional phenomenon, with causal factors that are economic, spatial, political, and social, means that efforts to address it must also be multi-dimensional.

Urban food security is primarily an issue of access, and households deploy different food sourcing strategies depending on their capabilities, and many households deploy multiple strategies. Such an understanding has implications for developing and supporting multiple pathways to food. The conceptual frameworks of vulnerability and resiliency have much to offer in terms of understanding how different vulnerabilities can be mitigated with different strategies of resilience.[17]

[16] The current disputes in the Philippi Township in Cape Town is a prime example of the contestation over urban land use. A research study showed that this land contributes significantly to livelihood and food security in the area, but municipal officials are under increasing pressure to develop the area for housing: http://www.freshfruitportal.com/2013/08/05/south-africa-cape-towns-vegetable-basket-under-urban-pressure/?country=othersChromeHTML\Shell\Open\Command

[17] Agyeman and Simons (2012) discuss the concepts of food resiliencies and food vulnerabilities. 'Food resiliencies' refers to the adaptive capacity of the food provisioning system, while 'food vulnerabilities' refers to interactions between food and political and economic asymmetries that make food provisioning difficult.

The food environments of today and tomorrow do not match the food environments of yesterday. The trajectory in 'modern' food systems has been to develop extensive food systems[18] that rely heavily on petrochemicals, and which are based on the principle of competitive or comparative advantage, economies of scale, and liberalization of markets. In an environment of cheap energy and relative indifference to the environmental effects of energy intensive agri-food systems, this kind of extensive food system, governed by economies of scale and locational comparative advantage, was tenable. What happens when it becomes untenable? It may be that a sea change in the objectives of the food system, which moves it from the province of 'globalization' to 'regionalization and localization in a global context,' needs consideration.

The traditional/informal food sector will remain a critical and primary source of food for the majority of urban residents well into the future, and will be particularly important for the poorest urban populations. Activities in this sector include production, processing, and distribution and large numbers of people rely on them for both food and income. However, livelihood security in the sector is tenuous due to government practices and policies that regard these activities as illegitimate or illegal.[19] Food traders, for example, may have their wares confiscated by authorities on a regular basis, while those practicing urban agriculture may be subject to eviction. In addition to the immediate impact on incomes, that these livelihoods are regarded as illegitimate also means that there are few services available to the people practicing them, e.g., access to loans, ability to influence decision-making, access to information, and extension advice.

IMPLICATIONS FOR INVESTMENTS AND INNOVATION DEVELOPMENT AND SCALING

There are a number of investment implications, which we have organized into four broad categories. In functional terms, the categories are not distinct; investments into infrastructure, for example, will have an effect on incomes.

1. **Planning Approach:** As a mode of operation, approaches that are capable of considering and integrating multiple perspectives are required. One way to engage is through the city planning process, which perhaps can also serve to build capacity with local governments. As Satterthwaite (2010) notes, urbanization, *per se*, does not create the problems that growing urban areas are experiencing, such as limited access to potable water and the lack of basic infrastructure. Rather, it is the "inadequacies in the response by governments and international agencies. In most nations, the pace of economic and urban change has outstripped the pace of needed social and political reform, especially at local government level" (p. 2810). To address this gap, the Association for African Planning

[18] Here, the word 'extensive' is used to refer to the food system as a whole. In a globalized food system, the acquisition of food becomes an increasingly extensive endeavor. This note is meant to distinguish the more familiar use of the words extensive/intensive as they are used in relation to agricultural production.

[19] Municipal governments throughout Africa have typically treated urbanization as a problem to be contained and, thus, have not dealt well with rapid growth. Some communities within many cities lack basic water and sanitation infrastructure, social services, effective management, and sustainable livelihoods. Hansen and Vaa (2004) note that "many decisions affecting urban development and day-to-day urban management are made without appropriate information" and that urban development projects often fail "due to their lack of prior consideration of the prevailing legal and institutional frameworks" (p. 19). There is a great need for substantive research to inform a deliberative process of urban development, including food provisioning. Continuing to watch cities develop "as they will" is, thus, an untenable position.

Schools is working to build capacity with African planners and planning schools to be more responsive to the urban conditions of African cities, as well as to better accommodate informality (Cameron, Odendaal, & Todes, 2004; Foth, Odendaal, & Hearn, 2007; Odendaal, 2012; Roy, 2005).[20] In order to feed growing populations in safe and healthy ways, and to support the livelihoods of those working in urban food systems, there is a need to work with municipal officials to develop inclusive strategies that better address the specificities of food provisioning and exchange in particular cities. For example, in towns where there is a heavy reliance on, or need for, urban agriculture, municipal planners might work to develop flexible land-use policies that allocate and protect productive spaces within urban boundaries. Extension agencies might develop a set of guidelines for urban production or livestock management. Reasonable limits might be set for the numbers of allowable traders in particular areas, and a corresponding number of permits issued that protect traders from harassment.[21] Most city governments do not have food security policies, so working to develop them can begin with municipalities that are amenable to change. Methods for involving urban populations can draw from the other work that has been done in relation to slum upgrading, e.g., with Slum Dwellers International (http://www.sdinet.org/).

2. **Livelihood and Income:** The traditional sector has largely developed in the absence of formalized institutional or municipal support/allocation of resources. As a result, economic activity is highly individualized, and though traditional food environments may be characterized by a high level of dynamism and activity, the ability to generate or scale entrepreneurial innovation is limited. Many cities, for example, are characterized by highly decentralized and diversified food exchange networks that help to create widely accessible sources of food for many urban residents. At the same time, because the sector is highly individualized, urban traders bear a disproportionate amount of the costs it takes to move food from rural to urban environments. To address constraints in the sector, and to enable the development of more innovation among entrepreneurs, municipalities should support urban food-based livelihoods with:

    a. Improved access to services, including information, training, and microfinance;
    b. Improved methods of transportation and innovations in arbitrage;
    c. Development of policies and practices that improve livelihood security for those working in the informal sector;
    d. Improved methods of empirical data gathering that can be used to develop appropriate policies; and
    e. Supporting and working with organizational formations, such as membership-based organizations (MBO's), to develop actionable recommendations for improving conditions in the sector.

3. **Infrastructure and Markets:** Many traditional markets suffer from a lack of municipal support, and, as a result, are characterized by any number of conditions that undermine traders' abilities to practice livelihood. Many traditional markets are characterized by congested and unhygienic

[20] http://africancentreforcities.net/programmes/knowledge-networks/association-of-planning-schools/

[21] WIEGO (Women in Informal Employment Globalizing and Organizing) has produced a report that outlines supportive practices for those working in the informal sector: http://www.inclusivecities.org/iems-street-vendors-sector-report/

conditions, and lack even basic infrastructure, such as proper storage facilities, running water, or electricity. Better conditions at markets can improve food safety and create more pleasant conditions for practicing livelihood. In addition, better infrastructure, such as good storage facilities, can help to navigate seasonal scarcities. We stress that these 'fixes' must not be thought of in purely technological ways. Various forms of organization, for example, have been successful in improving trash management. The introduction of community toilets will not work unless there are also organizational forms that can monitor and care for the facility. Storage facilities must be cleaned regularly, and people must have the skills to practice proper pest management.[22]

4. **Resilient Supply Chains:** Economic and environmental uncertainty requires food-sourcing strategies that are flexible and based on good, easily-accessible information so that they can respond nimbly and according to changing and unpredictable circumstances. 'Resilience' is a conceptual framework that can be used in decision-making about how to develop city food-sourcing strategies. Applying the concept of resilience to supply chains is a new concept, and we suggest this as a promising area for research.

Lastly, as a community interested in the future of urban food systems, we are on the leading edge of a major problem that has yet to be explored or even properly understood. Researchers should employ methods that analyze problems/issues from a number of scales (e.g., citywide, neighborhood, household, individual), and a number of perspectives (e.g., disaggregated by gender, education, ethnicity, income, spatial location). Both qualitative and quantitative methods should be used (e.g., surveys, interviews, GIS, income data). Such a research agenda represents a cutting edge approach and offers enormous opportunities for supporting municipal governments with 'actionable' research.

[22] Again, the WIEGO report is helpful in understanding the conditions that affect informal workers based on interviews with people working in the sector.

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