

Progress in Development Studies

<http://pdj.sagepub.com/>

Food security in Southern African cities : The place of urban agriculture

Jonathan Crush, Alice Hovorka and Daniel Tevera

Progress in Development Studies 2011 11: 285

DOI: 10.1177/146499341001100402

The online version of this article can be found at:

<http://pdj.sagepub.com/content/11/4/285>

Published by:



<http://www.sagepublications.com>

Additional services and information for *Progress in Development Studies* can be found at:

Email Alerts: <http://pdj.sagepub.com/cgi/alerts>

Subscriptions: <http://pdj.sagepub.com/subscriptions>

Reprints: <http://www.sagepub.com/journalsReprints.nav>

Permissions: <http://www.sagepub.com/journalsPermissions.nav>

Citations: <http://pdj.sagepub.com/content/11/4/285.refs.html>



Food security in Southern African cities: the place of urban agriculture

Jonathan Crush

Department of Global Development Studies, Queen's University, Kingston, Ontario K7L 3N6 and Department of Environmental and Geographical Science, University of Cape Town

Alice Hovorka

Department of Geography, University of Guelph, Guelph, Ontario

Daniel Tevera

Department of Geography, Environmental Science and Planning, University of Swaziland, Kwaluseni, Swaziland

Abstract: Several decades of research on 'urban agriculture' have led to markedly different conclusions about the actual and potential role of household food production in African cities. In the context of rapid urbanization, urban agriculture is, once again, being advocated as a means to mitigate the growing food insecurity of the urban poor. This article examines the contemporary importance of household food production in poor urban communities in 11 different Southern African Development Community (SADC) cities. It shows that urban food production is not particularly significant in most communities and that many more households rely on supermarkets and the informal sector to access food. Even fewer households derive income from the sale of produce. This picture varies considerably, however, from city to city, for reasons that require further research and explanation.

Key words: food security, urban agriculture, urbanization, SADC, poverty

By 2030, over half of Africa's population will reside in urban areas. Rapid urbanization has produced an 'invisible crisis' of urban food security (Crush and Frayne, 2010a). The standard definition of food security adopted

by the international community in 1996 is 'a state when people at all times have physical and economic access to safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life' (FAO, 1996).

There is considerable debate about how to measure the different dimensions of food insecurity implicit in this definition (Barrett, 2010; Bilinsky and Swindale, 2007; Coates *et al.*, 2003; Swindale and Bilinsky, 2006a; Webb *et al.*, 2006). The most commonly used quantitative indicators were developed by the Food and Nutrition Technical Assistance Project (FANTA) in Washington (Coates *et al.*, 2003, 2007; Swindale and Bilinsky, 2006b). In the urban context, accessibility is the key to food security. As Ruel *et al.* (2010: 170) note, individuals (and households) are 'generally net food buyers who rely on income for their food security, spend a large proportion of households' budgets on food, and have little access to other safety nets like agriculture or land to ensure food access in times of crisis'. A recent household food security survey of 11 Southern African cities by the African Food Security Urban Network (AFSUN) used the FANTA indicators and found that 75 per cent of poor urban household were food insecure (Frayne *et al.*, 2010).

The link between urban agriculture and food security has been recognized for many years (Atkinson, 1994; Gutman, 1987; Sanyal, 1987). The UNDP (1996: 162), for example, noted that urban agriculture can contribute significantly in combating urban hunger and malnutrition by providing increased and more consistent access to fresh, nutritional food at lower cost than market purchases. Studies in the 1980s and early 1990s documented increasing rates of participation in urban agriculture in Southern and East Africa (Briggs, 1991; Freeman, 1991; Mbiba, 1995; Rakodi, 1985, 1988; Sanyal, 1985; Sawio, 1993). The case study evidence seemed to suggest that urban cultivation had become a major food security strategy for poor households and the newly urbanized across the region (Rogerson, 1992). In Zambia and Zimbabwe, for example, increased household food production was viewed as a response by poor urban households to growing economic hardship and resultant

food insecurity (Drakakis-Smith, 1994; Drakakis-Smith and Kivell, 1990; Drakakis-Smith *et al.*, 1995; Drescher, 1994; Mbiba, 1995; Mudimu, 1997).

In war-ravaged Mozambique, the peri-urban areas of Maputo became a site of vegetable and livestock production for this rapidly expanding city (Sheldon, 1999). In Botswana, despite serious environmental constraints, there was also evidence of expanding urban food production (Moshia, 1999). In urban South Africa, household food production reportedly escalated following the end of apartheid with continued city growth, increasing levels of food inflation and rising unemployment within the formal economy (Martin and Oudwater, 2000; Martin *et al.*, 2000; May and Rogerson, 1995; Rogerson, 1995, 2002).

The weight of opinion was that given the right policy environment, urban cultivation could be the panacea for food insecurity during rapid urbanization (Binns and Lynch, 1998; Rogerson, 1998, 2001; van Veenhuizen and Danso, 2007). As the IDRC (a major sponsor of urban agricultural research and policy-making) noted:

The cities of the South are growing fast as people move from the countryside to seek a better future. So fast that the municipalities cannot keep up with the influx. There are too few jobs and limited facilities. Many of these new arrivals face poverty and malnutrition, often spending three-quarters of what little income is available to provide just one meal a day. In an effort to improve their situation, many of the urban poor use any available space to grow more food. From rooftops to window boxes, on roadsides, riverbanks, and vacant lots, people will find places to grow a little food to feed their families. Some even manage to grow enough to sell the surplus, providing much needed income. For others, especially on the outskirts of the city, farming becomes their main occupation and may provide support for an entire family or group of families. (IDRC, 2006)

Advocacy-driven enthusiasm prompted such optimistic book and programme titles

as 'cities feeding people' (Egziabher *et al.*, 1994), 'hunger-proof cities' (Koc *et al.*, 1999), 'self-reliant cities' (Mougeot, 1999), 'cities farming for the future' (van Veenhuizen, 2006) 'agropolis' (Mougeot, 2005), 'growing better cities' (Mougeot, 2006) and 'urban harvest'. Positive conclusions were drawn about the actual and potential impact of expanded urban agriculture on household food security. For example, households engaged in food production appeared to achieve greater food security and their nutritional status tended to be better than that of non-farming urban households of the same socio-economic status. In addition, production for consumption and sale could generate revenue and reduce monthly household expenditures on food, leaving more cash available for other basic household needs (such as health, housing, education and clothing).

There were a small number of dissenting voices. Ellis and Sumberg (1998: 221), for example, noted that 'the term urban agriculture both claims too much and offers too little in the policy context of urban poverty and family food security. It claims too much by equating all food production in towns with improved food security for poor people, and it offers too little by failing to consider the role of rural-urban interactions in explaining the survival capabilities of the urban poor.' Tevera (1999) argued that there was little evidence to suggest that the truly poor derived much benefit from urban agriculture because the very poor and new arrivals to the city have limited access to land and tend to shift residences too often for them to engage in urban agriculture. Webb (1996, 1998, 2000a, 2000b) questioned the evidence for the positive nutritional impacts of urban agriculture on the diets of the poor.

More recently, scepticism (if not outright pessimism) has increasingly characterized discussion about the extent, impacts and potential of food production by the poor in Southern Africa's urban areas. The benefits of urban agriculture for the poor had been 'grossly exaggerated' in the past and the real

poor derive little benefit (Hampway, 2008: 66). A more cautious and critical approach has thus emerged that seeks to understand the possibilities and the limits of what urban food production can actually deliver to poor households. In part this reassessment has been prompted by the relatively limited policy impact of a decade or more of research. In its new 'From Seed to Table (FSST) Project', for example, RUA Foundation (2010) highlights 'the constraints that limit the development of safe and sustainable urban agriculture'. These include limited (or inappropriate 'rural' oriented) support services (extension services, access to credit, infrastructure development); a lack of recognition by city authorities, urban planners and government institutions of the role and functions of urban and peri-urban agriculture in a developing modern city; limited access to productive resources; use of basic implements such as the hoe; and insecure land tenure. Other inhibiting factors include a low degree of formal organization of urban producers which 'limits their capacities to improve their farming systems and marketing opportunities' and low agricultural productivity and profitability. One result of these 'mounting problems affecting urban agriculture' is low intensity use and even the growing abandonment of urban and peri-urban agricultural lands (RUA Foundation, 2010).

After several years of declining research interest, there seems to be a renewed focus on urban food production amongst researchers and policy-makers. This is a positive development, as the urban food security context of today is not the same as it was in the 1980s and 1990s. Towns and cities have grown considerably since then and continue to increase rapidly in size through migration and natural increase. Competition for resources, including land, has intensified. In many cities, water delivery has been privatized thus making one of the key inputs for urban agriculture considerably more expensive.

This article asks what role urban production currently plays in the food security

of the residents of Southern Africa's rapidly urbanizing towns and cities and how this role can be further enhanced. The article presents and discusses the results of a regional baseline survey on urban food security in Southern Africa conducted in 11 African cities by the AFSUN in 2008–09. The survey provides an overview of the current state of food production in the poorer areas of Southern African cities and insights into the role of urban food production as a food source. The survey shows that across the region rates of participation in urban food production in poor urban communities are currently quite low, with some variation between cities. Even more significant is the fact that very few households derive income from the sale of home-produced food. This has considerable implications for the idea that food insecure households are most likely to grow some of their own food (Martin and Oudwater, 2000; Martin *et al.*, 2000).

I Forms of urban food production

Urban agriculture is often advocated as a means to address growing vulnerability and poverty, persistent food insecurity, declining livelihood opportunities and gender inequality in the contemporary urban economy:

The local production of food, and associated local marketing of fresh and processed products, increase the food security of the poor by making food locally available, and at lower prices, and by improving the nutritional balance of the family diet. Creation of better conditions for periurban and urban families to produce and market vegetables, fruits, livestock products and fish, can positively affect the nutrition and health of vulnerable urban groups, especially in situations where women gain control over the destination of the produce and revenues from sales. (Bruinsma and Hertog, 2003: 9)

Urban agriculture involves the production of plants and tree crops and animal husbandry on plot, in open public spaces and on unused privately owned land within the city and in the peri-urban zone. The land market for urban agriculture is mainly informal and most

people cultivate land they do not own or have legal access to. In Southern African cities, squatting, borrowing and user rights are the most common methods of accessing cultivable land for urban agriculture. The most commonly cultivated crops are leafy vegetables and maize, which is the staple crop in most parts of the continent, but urban agriculture usually also includes livestock rearing.

In overcrowded Southern African cities, many households (especially low-income households who live on residential properties of less than 350 square metres) do not have enough land on their own plots. This has given rise to 'open space' or 'off-plot' food production:

Urban agriculture is – to a large extent – being done on land that is not owned by the user: roadsides, riverbanks, along railroads, idle public lands, parks, etc. The use of such areas is, in principle, transitional and user rights are minimal. However, various systems of informal rent, lease and inheritance exist. The quality of the lands to which urban farmers do have access is often very marginal to start with. In combination with the poverty of the majority of the urban farmers and the insecure land-tenure situation, this leads to low investments in the land, low productivity and further deterioration of the soil. Fear of eviction leads people to plant quick-yielding seasonal crops and to avoid investments in soil quality, tree and shrub components, erosion prevention, water-harvesting measures, etc. Next to land, the access to water (especially water of good quality) and nutrients (especially manure and compost of good quality) is crucial to urban farmers, and both are difficult to obtain (although more widely available as in many rural areas). Use of water sources is often informal (e.g. tapping off wastewater disposal pipes and canals). (RUAF Foundation, 2010)

In Gaborone, some 60 per cent of urban food production enterprises operate on allocated plots on tribal land (Hovorka, 2004). The land is allocated free of charge and based on usufruct rights to communal land.

In Lusaka, one study showed that extensive cultivation of maize, sugar cane and sweet potato was taking place on peri-urban land owned by the Council, in a *dambo* (wetland) area on rented privately owned land and rented on the northern peri-urban fringe, a mix of Council and rented land (Hampwaye, 2008). Many of these 'open space and contested' sites were under threat from urban developments, particularly housing projects (Hampwaye, 2008: 29).

Urban cultivators generally belong to one of three main groups (Byerley, 1996: 3). Usually one group is dominant but in some cities or parts of a city all three groups can be found (Smith, 2006). The first group comprises members of the lowest socio-economic urban stratum who grow a certain proportion of their own food requirements due to absolute need. Studies in Atteridgeville near Pretoria, for example, have found that 88 per cent of households were recent migrants from the countryside and that 54 per cent were actively involved in some form of food production. However, the average monthly income obtained from household production was only about R 6 which represented less than 1 per cent of total monthly household income (Maswikaneng, 2003; van Averbek, 2007). Another recent study in the poor informal settlement of Orange Farm, south of Johannesburg, found that 89 per cent of households engaged in urban farming had no household members in formal employment. Around a third of farming households relied on home-produced food for over 40 per cent of their food (Onyango, 2010). For a variety of reasons, however, urban food production is not particularly common in this poor area with only 16 per cent of households obtaining some of their food in this manner (Rudolph *et al.*, 2009).

In Harare, Smith and Tevera (1997) observed that economic hardships which emerged following the implementation of the Economic Structural Adjustment Programme had compelled many middle income households to

engage in urban agriculture on their plots and on open municipal land.

The second group comprises urban households who 'choose to cultivate in order to attempt to preserve their standards of living during inflationary times of crises and also to reduce their vulnerability to the possible breakdown of formal food channels' (Byerley, 1996: 3; Dima *et al.*, 2003). Households in this category grow primarily for their own consumption but may also market any surplus on an occasional basis. A recent study of the production and marketing of indigenous vegetables in Durban, for example, found that the bulk of the produce was consumed at home (Shackleton *et al.*, 2010: 304). While most urban farmers did not sell any vegetables, some did 'in small quantities and at irregular intervals'. Another study of households in Lilongwe and Blantyre in Malawi found that urban food production is dominated by higher income households who are able to access more land and agro-inputs (Mkwambisi, 2009). The study showed that urban production is a source of both food and income, though the relative importance of each varied by type of household, with higher income households selling a larger absolute (but lower proportional) volume of produce and female-headed households selling more than male-headed households.

Over time, a third group of urban cultivators has emerged: small-scale entrepreneurs who engage in urban food production explicitly for sale rather than home consumption (Nugent, 2003). The entrepreneurial form of urban production has been observed in a number of Southern African cities. In Botswana, studies in the 1990s initially showed only limited agricultural production in and around the main urban areas of the country (Matsila, 1999; Molefi, 2000; Mosh, 1996, 1999). This was attributed to harsh climatic conditions, scarcity and expense of water, land access and availability, rural cultivation preferences, relative lack of poverty, cultural/attitudinal factors, government safety nets

and policy, planning regulations, recent urbanization, and greater returns to land and labour in other urban activities. However, a more recent study in Gaborone showed that middle-income producers were generating substantial amounts of foodstuffs for the urban market (Hovorka, 2004, 2005). The study of 114 entrepreneurs found a concentration of activity in poultry farming and, to a lesser extent, horticulture. However, these were not the urban poor but 'generally well-educated, middle-income, urban residents who are employed' (Hovorka, 2004: 377). Middle and higher income household involvement in commercial agriculture has been documented in urban peripheries in Mozambique, Zambia and Zimbabwe (Drakakis-Smith and Tevera, 1997; Hampwaye *et al.*, 2007; Mudimu, 2001; Mutonodzo, 2009; Sheldon, 1991, 1999, 2003).

The extent of each of these forms of urban food production is unknown in most cities, let alone across the Southern African Development Community (SADC) region as a whole. The AFSUN conducted a household food security baseline survey in 2008–09 to provide a broad regional picture of the state of household food insecurity in the poorer areas of Southern African cities. The survey collected information on the prevalence of different types of urban cultivation, the contribution of urban agriculture to food security and the role of urban food production in urban food supply systems more broadly.

II The state of urban food production in SADC

The AFSUN urban food security baseline survey was conducted simultaneously in 11 SADC cities in 8 countries using the same methodology and survey instrument in each city (Frayne *et al.*, 2010). The cities included Blantyre, Cape Town, Gaborone, Harare, Johannesburg, Lusaka, Maputo, Manzini, Maseru, Msunduzi (Pietermatitzburg) and Windhoek. The surveyed cities represent a mix of primary and secondary cities; large and small

cities; cities in crisis, in transition and those on a strong developmental path; and a range of local governance structures and capacities as well as natural environments.

AFSUN partner organizations planned the methodology and survey instrument at an interdisciplinary research planning workshop in June 2008 hosted by the University of Botswana. One or more poor urban neighbourhoods were identified by the local partner in each city. In the larger cities, such as Cape Town and Johannesburg, different types of formal and informal urban neighbourhoods were chosen. In smaller cities, a single representative neighbourhood was selected. Households were sampled using a systematic random sampling technique. The resulting AFSUN Urban Food Security Regional Database contains information on 6,453 households and 28,771 individuals. This is the largest single database on urban food security ever created in the region. In addition, it is unprecedented in being conducted simultaneously in so many cities. This affords unique opportunities for comparison between cities and across the SADC region as well as within some cities.

In addition to a large number of questions on different facets of food supply, sourcing and consumption, poor urban households were asked three separate questions relating to different aspects of urban food production:

- Where does the household normally obtain its food and how often does it normally obtain food from these sources? 'Own production' was one of a number of options available to households.
- To what extent does the household use strategies other than formal employment to make a living? Households were offered four options ('not at all', 'slightly', 'partly dependent' and 'wholly dependent') and asked about four types of household food production: field crops (off-plot), garden crops (on-plot), tree crops and livestock.

- How much income did the household derive from urban farm products in the previous month?

1 Participation in urban food production

Across the 11 cities, around a fifth (22 per cent) of surveyed households said they normally grow some of their own food (Figure 1). This was far below the proportion who normally obtain food from supermarkets (79 per cent), the informal sector (70 per cent) and small retail and fast-food outlets (68 per cent) (Frayne *et al.*, 2010: 31). Only one city (Maputo) was anywhere close to the regional average (at 23 per cent). Four cities were well above the average: Blantyre (64 per cent), Harare (60 per cent), Maseru (47 per cent) and Msunduzi (30 per cent). A combination of factors including high levels of food insecurity in these cities and a change in official attitudes from intolerance to indifference (and occasionally support) may explain the high levels of urban household food production recorded. However, poorer areas in other cities were well below the regional average: Manzini (10 per cent), Johannesburg (9 per cent), Gaborone and Cape Town (5 per cent) and Windhoek (3 per cent) and Lusaka (3 per cent). In other words, simply because people are poor does

not mean that they will or can produce some of their food.

The extremely low rates of participation recorded by poor households in Cape Town and Johannesburg may not be typical of the country as a whole. The 2002 and 2007 South African General Household Surveys show, for example, that the poorer South African provinces, especially the Eastern Cape, have higher rates of participation in urban farming (Table 1) (Burger *et al.*, 2009). Rates of participation may also be higher in the country's smaller, poorer urban centres particularly in areas such as the Eastern Cape (Thornton, 2007, 2009; Thornton and Nel, 2009).

2 Reliance on urban food production

The fact that households rely on a particular source for some of their food says nothing about how often they obtain food from this source. For example, while 79 per cent of households said they normally obtain some of their food from supermarkets, only 5 per cent do so on a daily basis. By contrast, 70 per cent of households normally source food from the informal sector, but 31 per cent do so on a daily basis. With regard to urban cultivation, while 22 per cent of households obtain food

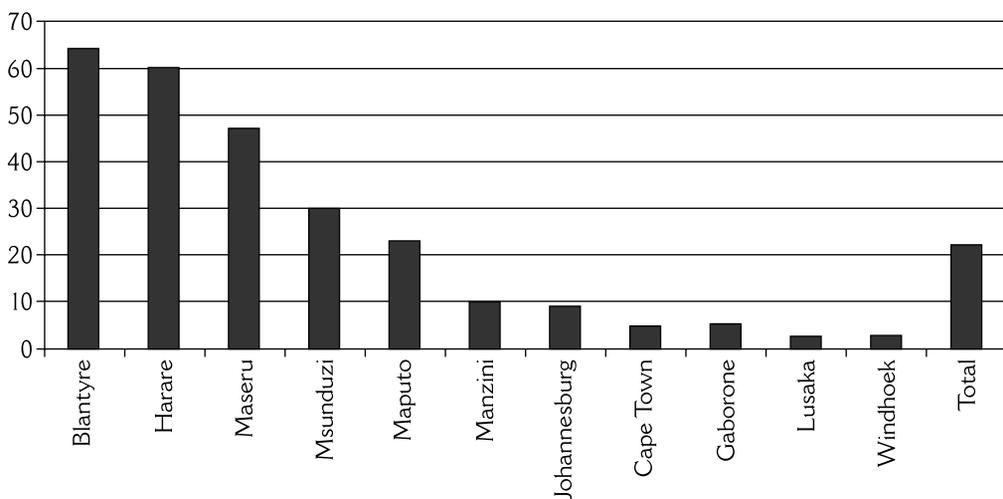


Figure 1 Proportion of urban households growing food (%)

Table 1 Urban farming by province, South Africa

Province	2002		2007	
	No.	%	No.	%
Eastern Cape	48,036	77	52,344	64
Free State	8,621	14	8,512	10
Gauteng	3,180	5	12,441	15
Northern Cape	1,559	2	1,779	2
Western Cape	723	1	1,767	2
North West	602	1	5,190	6

Source: Burger *et al.* (2009: 22).

Note: Data for Kwazulu, Mpumalanga and Limpopo not included.

from their own gardens (on-plot) or public fields (off-plot), only 8 per cent get food from this source at least once a week and another 3 per cent at least once a month (Table 2). Even these results are positively skewed by four cities. In Harare, for example, 41 per cent of poor households normally rely on home-grown food at least once a week, as do 21 per cent in Maseru, 15 per cent in Msunduzi and 12 per cent in Maputo. Households in most of the other cities do not consume home-grown food with any kind of regularity. Even in Blantyre, which has the highest overall participation rate, 54 per cent of households

said they source food from their own gardens less than once a year.

3 Urban food production as an additional means of making a living

This question asked households the extent to which they engaged in four different types of urban food production as an *additional* means to make a living. Dependence on urban food production as a supplemental food source is generally quite low across the major cities of the region. However, the extent of such dependence varies with the type of activity involved and from city to city (Figure 2). For example, 11 per cent of households across the region said they were partially or totally dependent on field crops as an additional means to make a living and 10 per cent said the same thing about garden crops. However, only 4 per cent were partially or totally dependent on livestock and 2 per cent on tree products.

In terms of inter-city differences, 61 per cent of households in Blantyre said they were partly or totally dependent on field crops as an additional livelihood strategy, followed by Harare (33 per cent), Gaborone (22 per cent) and Maputo (14 per cent) (Figure 2). In all of these cities households own or are able to access fields in the peri-urban areas or close

Table 2 Frequency of sourcing home-grown food

At least	Once a Week	At least once a month	At least once every six months	Less than once a year	Never
Windhoek	0	0	1	2	97
Gaborone	1	1	1	2	95
Maseru	21	9	13	4	53
Manzini	1	1	3	4	91
Maputo	12	6	3	2	78
Blantyre	1	0	8	54	37
Lusaka	2	0	0	1	97
Harare	41	7	9	3	40
Cape Town	1	1	1	1	96
Msunduzi	15	10	3	2	70
Johannesburg	2	1	4	1	92
Total	8	3	5	6	78
N	532	211	278	341	4,860

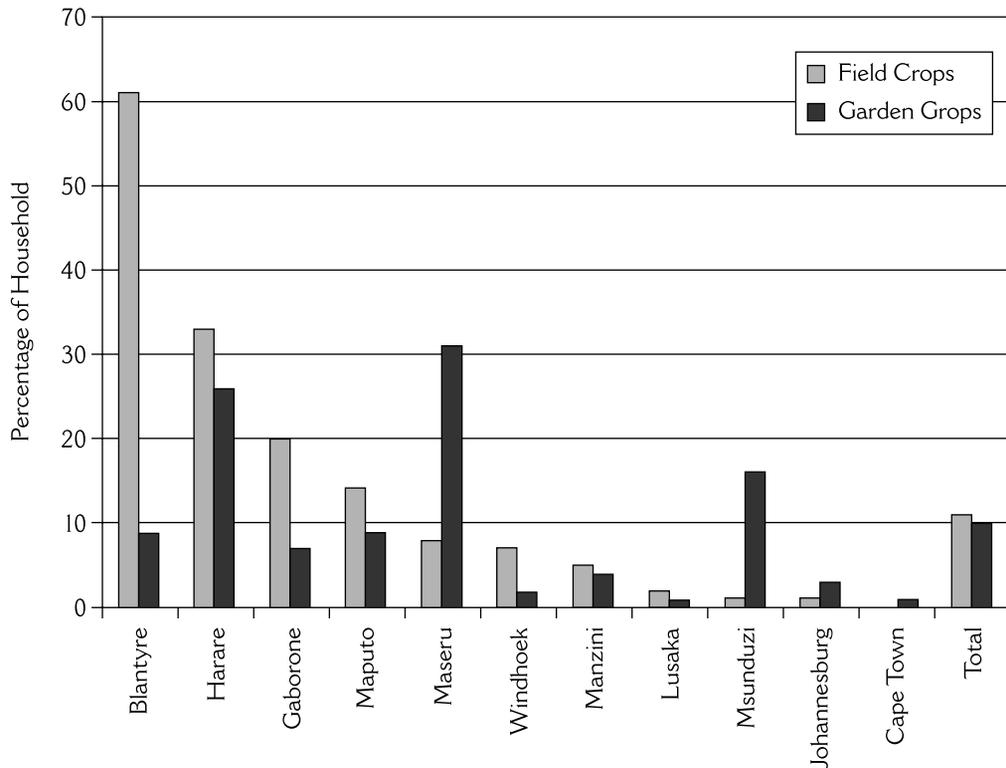


Figure 2 Field and garden cropping as livelihood strategies

to the city. Dependence on household garden crops, on the other hand, was much lower in Blantyre (9 per cent) and Maputo (3 per cent) and highest in Maseru (31 per cent), followed by Harare (27 per cent) and Msunduzi (16 per cent).

In every city, tree crops were important to less than 10 per cent of households (with Harare and Maseru the highest at 7 per cent and 6 per cent respectively). Maseru was next at 9 per cent and Windhoek at 7 per cent. Overall, therefore, there are only four cities where there is some dependence on urban field cultivation. And there are only two cities where garden crops are important (Maseru and Harare). Tree crops are relatively unimportant everywhere and livestock is really only significant in one city (Gaborone) where 14 per cent of households depend on livestock, mainly poultry (Table 3).

Field cropping is slightly more prevalent amongst extended (14 per cent) and nuclear (12 per cent) households than male-headed (7 per cent) and female-headed (5 per cent) households (Table 4). Female-headed households (9 per cent) are marginally more likely to engage in garden cropping than male-headed households (8 per cent), but both are lower than the frequency for nuclear households (11 per cent). There is no significant difference between households when it comes to tree cultivation and livestock rearing, with rates of participation lower than 5 per cent irrespective of household type. However, this does not mean that urban food production is not structured along gender lines. Evidence from case studies suggests that it is women and children, even in nuclear and extended households, who undertake the bulk of urban food production (Hovorka *et al.*, 2009). The

Table 3 Household food production as an additional livelihood strategy (total/partial dependence)

City	Field crops (% of HH)	Garden crops (% of HH)	Tree crops (% of HH)	Livestock (% of HH)
Blantyre	61	9	2	4
Harare	33	26	7	5
Gaborone	20	7	5	14
Maputo	14	9	3	4
Maseru	8	31	6	9
Windhoek	7	2	1	7
Manzini	5	4	1	3
Lusaka	2	1	0	1
Msunduzi	1	16	0	2
Johannesburg	1	3	2	1
Cape Town	0	1	0	0
Total	11	10	2	4

Table 4 Dependence on urban food production by household type

Type of household	Field crops		Garden crops		Tree crops		Livestock		N
	No.	%	No.	%	No.	%	No.	%	
Female	115	5	203	9	44	2	64	3	2,194
Male	55	7	59	8	17	2	31	4	774
Nuclear	247	12	218	11	41	2	70	3	2,065
Extended	205	14	132	9	40	4	68	5	1,419

lower-than-expected rates of participation by female-headed households probably have to do with inequalities in access to land and labour. For example, male-headed households often include a second adult (the spouse or partner) while female-headed households do not. In male-headed households, there are likely to be more people to distribute tasks amongst. In the female-headed household, women have to trade off time spent in wage employment (if available), trading and urban cultivation.

Clearly, land access is a key modality in urban food production. If we assume that households that own their own properties are more likely to have the land for cultivation than those who do not, then we might expect these households to have higher rates of participation. And indeed, over two-thirds of households who are dependent on food

production own their own houses (Table 5). No other housing type is remotely as important although renting a property does not always preclude having a garden. The very low rates of participation in urban food production by households in informal settlements is especially noteworthy (only 5 per cent of households who are dependent on field or garden crops live in informal housing).

Although households that have their own property are more likely to be dependent on food production than those that are not, the vast majority of owner-occupied units do not engage in urban food production. Only 15 per cent of these households depend of field crops, 14 per cent on garden crops, 5 per cent on livestock and 2 per cent on tree crops (Table 6). In fact, people living in rented accommodation (such as town houses),

Table 5 Dependence on urban food production by dwelling type

	<i>Field crops</i>		<i>Garden crops</i>		<i>Tree crops</i>		<i>Livestock</i>	
	No.	%	No.	%	No.	%	No.	%
House	449	68	426	70	105	71	166	66
Town House	66	10	17	3	8	5	13	5
Flat	12	2	18	3	11	7	10	4
Traditional Homestead	44	7	46	7	6	4	11	4
Backyard Room	15	2	12	2	6	4	13	5
Room in House	33	5	28	5	8	5	13	5
Room in Flat	16	2	30	5	1	1	15	5
Informal Dwelling/Shack	25	4	26	5	1	1	8	3
Other	2	0	3	0	0	0	2	0
Total	662	100	606	100	147	100	251	100

Table 6 Proportion of total households involved in food production by dwelling type

	<i>Field crops</i>		<i>Garden crops</i>		<i>Tree crops</i>		<i>Livestock</i>		<i>N</i>
	No.	%	No.	%	No.	%	No.	%	
House	449	15	426	14	105	2	166	5	3,079
Town House	66	22	17	6	8	3	13	4	305
Flat	12	2	18	3	11	2	10	2	527
Traditional Homestead	44	11	46	11	6	1	11	3	413
Backyard Room	15	11	12	9	6	4	13	4	137
Room in House	33	12	28	11	8	3	13	2	266
Room in Flat	16	4	30	7	1	0	15	4	400
Informal Dwelling/Shack	25	3	26	3	1	0	8	1	852
Other	2	0	3	0	0	0	2	0	85
	662	11	606	10	147	2	251	4	6,064

backyard rooms and rooms in houses have similar rates of participation in field and garden cropping. What is striking again is the very low rates of participation by households in informal settlements: only 3 per cent depend on field crops and garden crops and 1 per cent on livestock.

4 Urban food production as a source of income

Across the 11 cities, 22 per cent of households engage in some form of food production. However, only 140 out of over 6,000 households (a mere 3 per cent) derive any income from the sale of home-grown food in the month prior to the survey (Table 7). Over the course of a year, this figure would probably be higher but

Table 7 Households with cash income from food production

<i>City</i>	<i>No.</i>	<i>%</i>
Blantyre	72	51
Maputo	21	14
Maseru	17	12
Manzini	8	6
Harare	8	6
Cape Town	5	4
Lusaka	4	3
Msunduzi	3	2
Gaborone	1	1
Windhoek	1	1
Johannesburg	0	0
Total	140	100

still suggests that selling home-grown food is not a common income-generating strategy in the poor communities of SADC cities. Nearly 80 per cent of households who received income in the month prior to the survey in only 3 of the 11 cities: Blantyre (51 per cent), Maputo (14 per cent) and Maseru (12 per cent). In five of the cities (including the three in South Africa) less than 5 per cent of households are derive income from the sale of produce.

These low figures point to the inadequacy of urban markets as a mechanism of getting household-level produce to the commercial consumer. However, where it is more of a survival strategy than a business, efficient markets will still not result in greater commercial participation. When only 3 per cent of households are deriving income from the sale of produce, it suggests that the incorporation of

urban food production into informal and formal markets for produce is currently extremely limited.

5 Urban food production and food insecurity

The evidence suggests that across the region urban food production is motivated by household survival rather than commercial income-generating opportunities. This is further confirmed by the fact that food insecure households are far more likely than food secure households to engage in food production. In the regional sample as a whole, 77 per cent of households that engage in urban food production as an additional livelihood strategy turn out to be food insecure. With the exception of Johannesburg and Blantyre, in all of the cities over 70 per cent of households that grow food are food insecure (Figure 3)

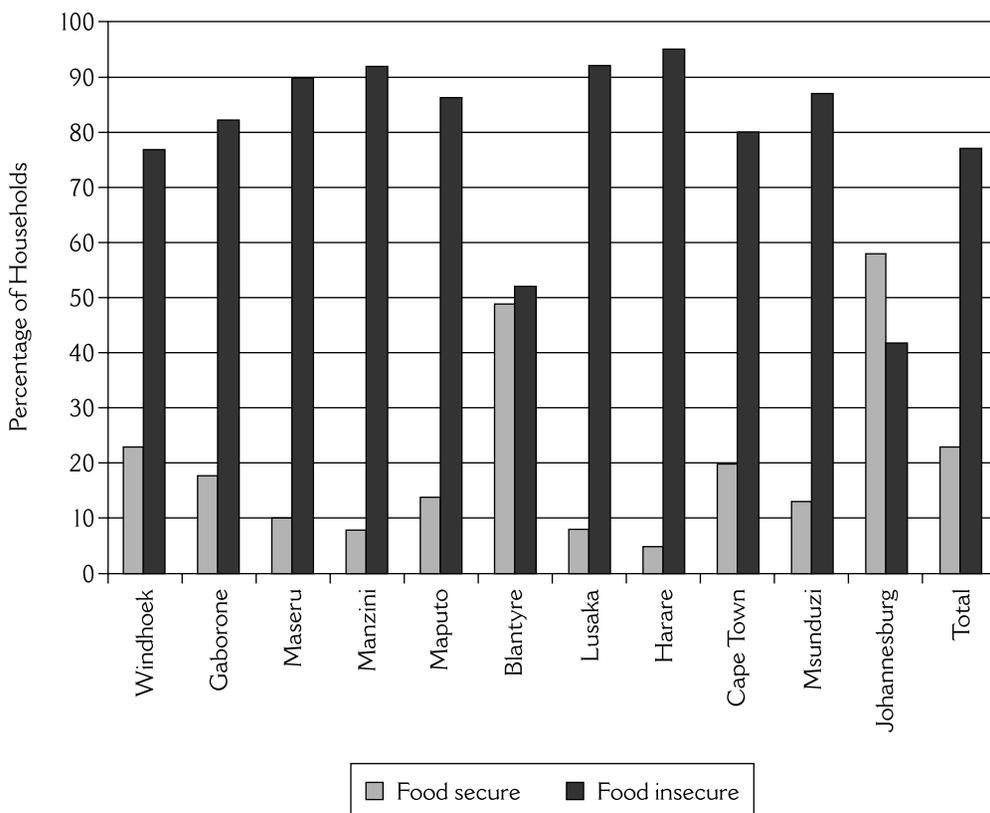


Figure 3 Urban food production and household food insecurity

(using the Household Food Insecurity Access Scale, HFIAS) (Coates *et al.*, 2007). It may well be that urban food production is responsible for some households becoming food secure. However, when three-quarters of households growing food are still food insecure, it suggests that the impact of urban food production may ameliorate the worst aspects of food insecurity but it does not currently solve the problem.

Proportion (per cent) of Households Using Urban Agriculture as an Additional Livelihood Strategy by Household Food Security Status

The one city finding requiring additional comment is Lusaka. In the 1980s, Lusaka was referred to as the 'urban agriculture capital' of Africa, so extensive was the use of urban land to grow food (Rakodi, 1985, 1988; Sanyal, 1985). In the 1990s, economic hardships led to further expansion in household food production. A newer trend, in addition to the traditional use of large open spaces and backyards, is the expansion of food production to a wider variety of urban locations including:

[...] between railway lines, around industrial areas, along roadsides, in the middle of roundabouts, under power lines, around airports, along rivers, or river valleys, on land occupied by educational and administrative institutions, around dams and sewerage installations, and on land which has been officially designated for residential development. (Simatele and Binns, 2008: 8–9)

Other recent studies appear to confirm the continuing importance of urban food production in Lusaka despite growing pressures on open space in the city (Hampwaye, 2008; Hampwaye *et al.*, 2007). In 2004–06, Simatele and Binns (2008) interviewed 140 urban producers in three areas of the city: (a) Chilenje (a planned medium- and low-cost housing area); (b) Garden Compound (a centrally located informal settlement of 60,000 people) and (c) Seven Miles (a peri-urban site which is 'a major source for the city's fresh fruit and vegetables') and concluded that 'large numbers

of Lusaka's urban dwellers are engaged in farming activities both within and on the periphery of the urban area'. Hampwaye's (2008) study in 2004–05 interviewed 100 urban farmers in (a) the Baobab Area (a peri-urban area owned by the Council and an extensive cultivation zone), (b) the *dambo* (wetland) area around the university (privately owned open space), (c) privately owned open space near the airport and (d) the Barlaston-Chunga area on the northern fringe (owned by the Council). This study concluded that 'urban agriculture is one of the common sources of food and income among the poor' (Hampwaye, 2008: 13). Both studies focused on identifying and interviewing producers. Unfortunately, neither provides information on the proportion of urban households involved in food production.

The AFSUN survey, however, found that only 4 per cent of households in the Lusaka survey were growing food as an additional livelihood strategy and only 3 per cent derived any income from the sale of produce. The answer to this puzzle appears to lie in the location of the research. The AFSUN survey was conducted in only one area of the city, Chipata Compound, one of the poorest areas of the city. Chipata Compound is an overcrowded informal settlement which is home to over 50,000 people. It has been described as an area in which 'large families share small, deteriorated houses, roads are muddy and full of pot-holes, garbage piles up, and people do their best to make their living selling tomatoes, onions and other small merchandise along streets or from their front yards' (Carlsson *et al.*, 2000: 24). The AFSUN survey suggests that in this area of Lusaka, with a very high concentration of poor households, food production is extremely limited, and that most households do not have access to the land to grow anything. Informal trading and selling appear to be the major means of making a livelihood and trying to mitigate food insecurity. Twenty-nine per cent of total household income in the sample of 500

households comes from wage work, 23 per cent from the informal sector and 17 per cent from casual work. In other words, while urban food production appears ubiquitous in Lusaka, it does not seem to be an option in some of the poorest areas of the city.

III Conclusion

Urban agriculture is not as widely practiced or as important to the food security of the urban poor in Southern Africa as is sometimes claimed. Urban food production plays a relatively minor role in the food supply of most households and very few derive any kind of income from the sale of home-produced food. In many cities, urban agriculture is practised by only a small minority of households, those with access to land and inputs and those who lack regular access to wage income and the ability to meet their needs through food purchase. This picture is seriously at odds with conventional wisdom about urban agriculture which relies, in the main, on case study evidence collected from those who do farm. This article argues, on the basis of the AFSUN baseline survey, that the prevalence and importance of urban agriculture is actually relatively low in poor urban communities across Southern Africa.

This conclusion needs to be qualified in three ways. First, the study focused on the poorer areas of the study cities. There is some case study evidence that urban food production (for market in particular) is more common amongst better-off households. The study does not provide any insights into the relevance and importance of urban food production across the city as a whole, an area for further research. Lusaka, for example, has long been seen as the exemplar of the positive impact of urban agriculture. However, the AFSUN survey was conducted in a poor informal settlement where urban agriculture turned out to be virtually non-existent.

The second qualification is that the conclusion does not hold for all poor communities in all cities. In Johannesburg, for example, there is virtually no urban food production

in the inner city, a little more in the newer informal settlement of Orange Farm and more still in the established township of Alexandra. Across the region, there is also considerable variation from city to city. Over 90 per cent of surveyed households in cities like Cape Town, Windhoek, Johannesburg and Gaborone do not source any of their food from urban agriculture. In contrast, the figure is only 40 per cent in Harare and 37 per cent in Blantyre. These intra- and inter-city differences are extremely important. Urban agriculture research and interventions need to acknowledge and consider that the prevalence, opportunities and obstacles to urban food production are place specific and to understand these much better.

Third, just because urban cultivation is not that widespread, it does not mean that it could not make a larger contribution to the food security of the urban poor. However, a serious effort needs to be made to understand the obstacles and constraints to growing this sector. The new international food security agenda focuses almost exclusively on raising food production by small rural farmers (Crush and Frayne, 2010). There is a very real danger that this approach will be transferred uncritically to urban areas. There is already 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 (Prain, 2006; Shackleton *et al.*, 2009; van Veenhuizen and Danso, 2007); training, technical advice and extension services for urban farmers; reducing the health and environmental risks of urban agriculture (Flynn, 1999); improved access to agricultural inputs and credit (Drechsel and Kunze, 2001; Drechsel *et al.*, 2006); 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

(Smit and Bailkey, 2006; van Veenhuizen and Danso, 2007). In Southern Africa, these kinds of technical, extension and support activities are much less common (or commented upon) than in other parts of the world. However, as elsewhere, such technocratic 'solutions' are likely to fail if they do not first examine why so few poor urban households in Southern Africa grow any of their own food.

In the past, research on urban cultivation has tended to be isolated from analysis of the urban food supply system as a whole. A new approach needs to first situate the existence and potential for greater urban food production within a broader social, economic and political context (Tambwe, 2006). In the global economic context, we need to know what rising global food prices do to the incentive to self-produce and whether supermarket expansion is a threat or an opportunity for small urban food producers (Weatherspoon and Reardon, 2003). At the national level economic (mis)management policies and the privatization of essential services, for example, impact on urban food production by households. Privatization of water delivery, for example, raises the costs of water and simultaneously reduces income available for food purchase. Or again, there is the question of whether national social protection schemes (such as pensions and child grants) are a disincentive to urban food production.

At the household level, urban food production is only one (possible) component of broader household food access and security strategies. As de Zeeuw (2004) has noted:

It is not its urban location which distinguishes urban from rural agriculture, but the fact that it is embedded in and interacting with the urban system. Such linkages include the use of urban residents as labourers, use of typical urban resources (like organic waste as compost and urban water for irrigation), direct links with urban consumers, direct impacts on urban ecology (positive and negative), being part of the urban food system, competing for land with other urban functions, being influenced by urban policies

and plans, etc. It is often thought that urban agriculture is a relic of rural habits that has come with the migrants to the cities and that will dwindle over time but that is not correct. It is an urban phenomenon that tends to grow when cities grow (although its locations and characteristics change sharply).

Urban food production must also be contextualized within the urban food provisioning system: 'the processing and marketing of food produced in and around the city, as well as food from other channels (rural areas, imports) and their linkages and relative contributions to the health and nutrition of the population and to the local economy and environment' (de Zeeuw, 2004). Analytically, it needs to be situated within the context of complex interlinked urban food supply systems (including urban food provisioning as a whole which is undergoing rapid transformation throughout the region with the rise and consolidation of modern supply chains and supermarkets). These are the kinds of questions that contemporary researchers need increasingly to grapple with to fully comprehend the complex linkages between urban food production and urban food security. Conceptually, urban agriculture no longer starts and stops at the urban (or peri-urban) boundary.

Analysis of the relationship between urban food production and urban food systems also requires that cross-cutting issues be mainstreamed into the analysis. Gender is a key issue here (Hovorka, 2006; Hovorka *et al.*, 2009). Most research from a gender perspective focuses on the role of women as urban farmers to render their contribution to feeding cities more visible (Hovorka, 2003). There has also been some limited work on child labour in urban food production (Mkwambisi, 2005; Mlozi, 1995). Disaggregation of the gender-neutral concept of the 'urban farmer' shows that women play significant roles in urban food production and contribute to both urban household and market economies. Women also benefit from activities that allow them to successfully combine their multiple

roles in subsistence, production and environmental management. On the other hand, various constraints and obstacles (such as land access) hinder women's participation. Reinstating women as active agents in urban food production is an important step in understanding this activity but is not the same thing as a gender analysis of urban agriculture and urban food security. Gender analysis involves the examination of power relations and gender hierarchies, and men's and women's roles, responsibilities and social status in relation to perceptions of masculinity and femininity. Recognizing the centrality of gender dynamics leads to addressing key local and structural issues and processes that shape gender inequities and hinder food supply at multiple scales (Hovorka and Lee-Smith, 2006).

Environment is another important cross-cutting issue. Recent analysis of agriculture in urban areas has suggested that there are both positive and negative environmental impacts on the urban environment. In other words, health benefits are extended by the potential of agriculture to 'clean up' urban environments through reuse of wastewater, solid waste and organic materials (Belevi and Baumgartner, 2003; Drechsel and Kunze, 2001; Njenga *et al.*, 2007; Schertenleib *et al.*, 2004). On the other hand, when practiced poorly or under marginal environmental conditions, it can cause or exacerbate health problems due to contamination of produce through waste recycling or air pollution, disease transfer from animals to humans and leaching of agrochemicals into soils and water sources (Armar-Klemesu *et al.*, 1998; Birley and Lock, 1998; Flynn, 1999; Lock and de Zeeuw, 2003).

Considerable attention is currently being given to the possibility of incorporating small producers into modern urban food supply chains (Vorley *et al.*, 2007). However, the opportunities for small rural farmers to competitively access markets dominated by large supermarket retail companies seem extremely limited:

Currently there is little scope for small-scale producers or processors to compete with or be integrated with large-scale food processors in South Africa supplying the modern food system. In fact, small-scale processors supplying traditional markets with products such as bread, traditional beer, rice, meat and dairy products are under pressure and in no position to challenge the large-scale food processors in terms of supplying large supermarkets. (Louw *et al.*, 2007: 75)

Such pessimism is even more germane to small urban food producers who, despite the advantage of proximity, are generally unable to satisfy the stringent quantity and quality standards for fresh produce generally demanded by retail chains.

This has not dissuaded the FAO, amongst others, from adopting a bullish position on the 'profitability' of urban and peri-urban agriculture:

[It] can thus be a profitable undertaking at the household level, especially when producing products that are high in demand and that have a comparative advantage over rural production such as perishable products (e.g. green leafy vegetables and milk), mushrooms, flowers and ornamental plants. Urban animal husbandry can also be a profitable business. (FAO, 2007: 38)

However, almost all of the case studies cited are from West Africa, Asia and Latin America. The evidence from the AFSUN survey suggests that this is a more remote possibility for poor urban households in most Southern African cities. Of course, small-scale urban food producers may be unable or unwilling to supply large retailers and instead concentrate on informal or semi-formal marketing channels located in high-density/low-income areas of many cities. Facilitating the flow of foodstuffs to these market hubs, as well as onwards to consumers, may be of significant benefit to those wishing to extend or enhance their food production activities into income-generating realms. On the other hand, the rapid growth of supermarkets throughout the SADC region

may progressively close down these alternative channels (Crush and Frayne, 2010b).

In policy terms, the local and national state is not a neutral, passive 'observer' but an active 'player' or even 'spoiler' in urban food production. For example, while urban agriculture is an accepted land use in cities of Tanzania, existing by-laws militate against the activity. Indeed, there is a growing realization that two decades of academic research and 'workshop-talk' about urban agriculture have produced only minor shifts in policy. Some now see the lack of an enabling policy environment in cities globally as a major obstacle to maximizing the benefits of urban food production. As Mbiba (2000) notes, many urban farmers find themselves caught between 'suspicion and repression'. In other words, despite decades of experience with urban food production, its full potential as a source of food for home consumption and market is hampered by the absence of an enabling and supportive national and local policy environment. This is not uncommon around the region though there are now efforts to secure greater policy buy-in at the municipal level (Thornton *et al.*, 2010). In 2003, for example, the governments of Kenya, Malawi, Swaziland, Tanzania and Zimbabwe passed the Harare Declaration on Urban and Peri-Urban Agriculture. The declaration called for a shared vision around urban and peri-urban agriculture and acknowledged the institutional and resource barriers to effectively integrating the activity into urban economies. In essence, the declaration pledged to create an enabling policy environment for urban food production in these countries at least but it is unclear what this declaration has meant in practice.

Such efforts will have practical outcomes only if they provide a better understanding of urban food systems by local and national authorities (Mbiba, 2005). In many cities, agricultural production is still seen as a rural activity that does not belong in town, a potential health threat, a nuisance to people living in cities, detrimental to the local environment

and an activity that has little impact on the economy. In many Southern African cities, this activity is practiced informally without support and in the face of official opposition (Thornton *et al.*, 2010). Agriculture is rarely recognized as a legitimate land use activity in urban plans or municipal designs. For urban farmers, this means that land is scarce and they often ruffle the feathers of officials and police by establishing their farming activities wherever they can; urban farmers are often harassed by municipal authorities. Comprehensive, systematic research into the linkages between urban agriculture, food security and health/nutrition could go a long way to easing such institutional and political obstacles so that city farming can meet its full potential in Southern Africa.

Acknowledgements

The findings on urban food production reported in this article are based on data from the 2008–09 AFSUN Urban Food Security Household Survey. We wish to thank the following for coordinating the research in the partner cities: Ben Acquah, Jane Battersby-Lennard, Eugenio Bras, Rob Fincham, Bruce Frayne, Flo Kroll, Clement Leduka, Chileshe Mulenga, Aloysius Mosha, Peter Mvula, Akiser Pomuti, Ines Raimundo, Michael Rudolph, Nomcebo Simelane, Godfrey Tawodzera and Maxton Tsoka. Our thanks also to Mary Caesar, Scott Drimie, Cassandra Eberhardt, Miriam Grant, Jeunesse Park, Sue Parnell, Wade Pendleton, Cecilia Rocha, Christa Schier and Percy Toriro. The research was funded by the CIDA Partnership Branch through the UPCD Tier One Program.

References

- Armar-Klimesu, M., Egbi, G. and Maxwell, D.** 1998: Food contamination in urban agriculture: Vegetable production using waste water. In Armar-Klimesu, M. and Maxwell, D., editors, *Urban agriculture in the greater Accra metropolitan area*. IDRC.
- Atkinson, S.** 1994: Approaches and actors in urban food security in developing countries. *Habitat International* 19, 151–63.

- Barrett, C.** 2010: Measuring food insecurity. *Science* 327, 825–28.
- Belevi, H.** and **Baumgartner, B.** 2003: A systematic overview of urban agriculture in developing countries from an environmental point of view. *International Journal of Environmental Technology and Management* 3, 193–211.
- Bilinsky, P.** and **Swindale, A.** 2007: Months of Adequate Household Food Provisioning (MAHFP) for measurement of household food access: Indicator guide. Food and Nutrition Technical Assistance Project, Academy for Educational Development.
- Binns, T.** and **Lynch, K.** 1998: Feeding Africa's growing cities into the 21st century: The potential of urban agriculture. *Journal of International Development* 10, 777–93.
- Birley, M.** and **Lock, K.** 1998: Health and peri-urban natural resource production. *Environment and Urbanization* 10, 89–106.
- Briggs, J.** 1991: The peri-urban zone of Dar es Salaam, Tanzania: Recent trends and changes in agricultural land use. *Transactions of the Institute of British Geographers* 16, 319–33.
- Bruinsma, W.** and **Hertog, W.**, editors. 2003: *Annotated bibliography on urban agriculture*. ETC – Urban Agriculture Programme in cooperation with TUAN and other organizations.
- Burger, P. et al.** 2009: *Assessing the role of urban agriculture in addressing poverty in South Africa*. Working Paper No. 28, Global Development Network.
- Byerley, A.** 1996: *Urban agriculture in Botswana: A preliminary investigation of extent, issues and potential*. Swedish University of Agricultural Sciences, Working Paper 307.
- Carlsson, J. et al.** 2000: *Poverty and European aid in Zambia*. Working Paper No. 138, Overseas Development Institute.
- Coates, J., Webb, P.** and **Houser, R.** 2003: *Measuring food insecurity: Going beyond indicators of income and anthropometry*. Food and Nutrition Technical Assistance Project, Academy for Educational Development.
- Coates, J., Swindale, A.** and **Bilinsky, P.** 2007: Household Food Insecurity Access Scale (HFIAS) for measurement of food access: Indicator guide (version 3). Food and Nutrition Technical Assistance Project, Academy for Educational Development.
- Crush, J.** and **Frayne, B.** 2010a: The invisible crisis: Urban food insecurity in Southern Africa. AFSUN Series No 1, Cape Town.
- 2010b: Pathways to insecurity: Urban food supply and access in Southern African cities. AFSUN Series No. 3, Cape Town.
- de Zeeuw, H.** 2004: *The development of urban agriculture: Some lessons learnt*. Keynote paper for International Conference on Urban Agriculture, Agro-tourism and City Region Development, Beijing, 2004.
- Dimas, S., Ogunmokun, A.** and **Nantanga, T.** 2002: *The status of urban and peri-urban agriculture in Windhoek and Oshakati, Namibia*. Report for Integrated Support to Sustainable Development and Food Security Programme.
- Drakakis-Smith, D.** 1994: Food systems and the poor in Harare under conditions of structural adjustment. *Geografiska Annaler* 76B, 3–20.
- Drakakis-Smith, D.** and **Kivell, P.** 1990: Urban food production and household consumption: A study of Harare. In Findlay, A., Paddison, R. and Dawson, J., editors, *Retailing environments in developing countries*. Routledge, 159–84.
- Drakakis-Smith, D.** and **Tevera, D.** 1997: Socio-economic context for the householder of urban agriculture in Harare, Zimbabwe. *Geographical Journal of Zimbabwe* 28, 25–38.
- Drakakis-Smith, D., Bowyer-Bower, T.** and **Tevera, D.** 1995: Urban poverty and urban agriculture: An overview of the linkages in Harare. *Habitat International* 19, 183–93.
- Drechsel, P.** and **Kunze, D.**, editors. 2001: *Waste composting for urban and peri-urban agriculture: Closing the rural-urban nutrient cycle in sub-Saharan Africa*. CABI Publishing.
- Drechsel, P., Graefe, S., Sonou, M.** and **Cofie, O.** 2006: *Informal irrigation in urban West Africa: An overview*. International Water Management Institute Research Report No. 102. Colombo.
- Drescher, A.** 1994: Urban agriculture in the seasonal tropics of Central and Southern Africa: A case study of Lusaka. *International Policy Workshop on Urban Agriculture*.
- Egziabher, A. et al.**, editors. 1994: *Cities feeding people: An examination of urban agriculture in East Africa*. IDRC.
- Ellis, F.** and **Sumberg, J.** 1998: Food production, urban areas and policy responses. *World Development* 26, 221.
- Faber, M., Schwabe, C.** and **Drimie, S.** 2009: Dietary diversity in relation to other household food security indicators. *International Journal of Food Safety, Nutrition and Public Health* 2, 1–15.
- FAO.** 1996: *Report on the World Food Summit*. Rome.
- 2007: *Profitability and sustainability of urban and peri-urban agriculture*. Agricultural Management, Marketing and Finance Occasional Paper No. 19. Rome.
- Flynn, K.** 1999: *An overview of public health and urban agriculture: Water, soil and crop contamination and emerging urban Zoonoses*. Cities Feeding People Report Series, Report No. 30. IDRC.
- Frayne, B. et al.** 2010: *The state of food insecurity in Southern Africa*. AFSUN Urban Food Series No. 2.

- Freeman, D.** 1991: *A city of farmers: Informal urban agriculture in the open spaces of Nairobi, Kenya*. McGill-Queen's University Press.
- Gutman, P.** 1987: Urban agriculture: The potential and limitations of an urban self-reliance strategy. *Food and Nutrition Bulletin* 9, 37–42.
- Hampwaye, G.** 2008: Decentralisation, local economic development and urban agriculture in Zambia. Ph.D. University of Witwatersrand.
- Hampwaye, G., Nel, E. and Rogerson, C.** 2007: Urban agriculture as local initiative in Lusaka, Zambia. *Environment and Planning C: Government and Policy* 25, 553–72.
- Hovorka, A.** 2003: Gender and urban agriculture: Emerging trends and areas for future research. In Bruinsma, W. and Hertog, W., editors, *Annotated bibliography on urban agriculture*. ETC – Urban Agriculture Programme in cooperation with TUAN and other organizations, 281–85.
- 2004: Entrepreneurial opportunities in Botswana: (Re)shaping urban agriculture discourse. *Journal of Contemporary African Studies* 22, 367–88.
- 2005: The (re)production of gendered positionality in Botswana's commercial urban agriculture sector. *Annals of the Association of American Geographers* 95, 294–313.
- 2006: The no. 1 ladies' poultry farm: A feminist political ecology of urban agriculture in Botswana. *Gender, Place & Culture* 13, 207–25.
- Hovorka, A. and Lee-Smith, D.** 2006: Gendering the urban agriculture agenda. In van Veenhuizen, R., editor, *Cities farming for the future: Urban agriculture for green and productive cities*. IDRC, 125–36.
- Hovorka, A., de Zeeuw, H. and Njenga, M.**, editors. 2009: *Women feeding cities: Mainstreaming gender and urban agriculture in food security*. Practical Action Publishing.
- IDRC.** 2006: Feeding the sustainable city, http://www.idrc.ca/_images_110914/11577266631ua_eng.pdf
- Koc, M. et al.** editors. 1999: *For hunger-proof cities: Sustainable urban food systems*. IDRC.
- Lock, K. and de Zeeuw, H.** 2003: Health and environmental risks associated with urban agriculture. In Bruinsma, W. and Hertog, W., editors, *Annotated bibliography on urban and peri-urban agriculture*. ETC – Urban Agriculture Programme in cooperation with TUAN and other organizations.
- Louw, A. et al.**, 2007: South Africa. In Vorley, A., Fearne, B. and Ray, D., editors, *Regoverning markets: A place for small-scale producers in modern agrifood chains?* Gower, 75.
- Martin, A. and Oudwater, N.** 2000: Urban agriculture and the livelihoods of the poor in Southern Africa. In Hoffmann, H. and Mathey, K., editors, *Urban agriculture and horticulture: The linkage with urban planning*. International Symposium.
- Martin, A., Oudwater, N. and Meadows, K.** 2000: *Urban agriculture and the livelihoods of the poor in Southern Africa: Case studies from Cape Town, South Africa and Pretoria*. Natural Resources Institute.
- Maswikwaneng, M.** 2003: Urban agriculture in the informal settlements of Atteridgeville, Pretoria. M.Tech. Technikon Pretoria.
- Matsila, G.** 1999: Urban agriculture: A survival strategy for the urban poor: The case of Jwaneng. M.A. University of Botswana.
- May, J. and Rogerson, C.** 1995: Poverty and sustainable cities in South Africa: The role of urban cultivation. *Habitat International* 19, 165–81.
- Mbiba, B.** 1995: *Urban agriculture in Zimbabwe: Implications for urban management and poverty*. Ashgate.
- 2000: Urban agriculture in Harare: Between suspicion and repression. In Bakker, M., Dubbeling, S., Guendel, U., Koschella, S. and de Zeeuw, H., editors, *Growing cities, growing food: Urban agriculture on the policy agenda*. DSE, 285–302.
- 2005: Urban and peri-urban agriculture in Eastern and Southern Africa: Economic, planning and social dimensions. In Viljoen, A., editor, *Continuous productive urban landscapes*. Elsevier, 192–99.
- Mkwambisi, D.** 2005: Impact of urban agriculture on child labour, health and education in Lilongwe city, Malawi. In Manda, Z., editor, *Malawi physical planning*. Mzuzu, 94–111.
- 2009: Urban agriculture and food security in Lilongwe and Blantyre, Malawi. In Redwood, M., editor, *Agriculture in urban planning: Generating livelihoods and food security*. Earthscan and IDRC, 91–104.
- Mlozi, M.** 1995: Child labour in urban agriculture: The case of Dar es Salaam, Tanzania. *Children's Environments* 12, 197–208.
- Molefi, T.** 2000: The status and potential contribution of urban agriculture to food security and employment creation in urban Botswana: The case of Lobatse. M.A. University of Botswana.
- Mosha, A.** 1996: Poverty reduction initiatives in Gaborone city, Botswana. United Nations Centre for Human Settlements.
- 1999: The practice of urban agriculture in Gaborone. Department of Environmental Science, University of Botswana.
- Mougeot, L.** 1999: For self-reliant cities: Urban food production in a globalising south. In Koc, M., MacRae, R., Mougeot, L. and Welsh, J., editors, *For hunger-proof cities: Sustainable urban food systems*. IDRC, 11–25.
- editor. 2005: *Agropolis: The social, political, and environmental dimensions of urban agriculture*. IDRC and Earthscan.
- 2006: *Growing better cities: Urban agriculture for sustainable development*. IDRC.

- Mudimu, G.** 1997: Urban agricultural activities and women's strategies in sustaining family livelihoods in Harare, Zimbabwe. *Singapore Journal of Tropical Geography* 17, 179–94.
- 2001: The political economy of land for urban and peri-urban agriculture in Zimbabwe: Research perspectives and current issues on dynamics of land markets, strategies for access and patterns of land use. Proceedings of the MDP/IDRC Workshop on the Political Economy of Urban and Peri-urban Agriculture in Eastern and Southern Africa. Municipal Development Programme Regional Office for Eastern and Southern Africa.
- Mutonodzo, C.** 2009: The social and economic implications of urban agriculture on food security in Harare, Zimbabwe. In Redwood, M., editor, *Agriculture in urban planning: Generating livelihoods and food security*. Earthscan and IDRC, 73–89.
- Njenga, M. et al.**, 2007: Nutrient recovery from solid waste and linkage to urban and peri-urban agriculture in Nairobi, Kenya. In Bationo, A., Waswa, B., Kihara, J. and Kimatu, J., editors, *Advances in integrated soil fertility management in sub-Saharan Africa*. Springer.
- Nugent, R.** 2003: Economic impacts of urban and peri-urban agriculture. In Bruinisma, W. and Hertog, W., editors, *Annotated Bibliography on Urban Agriculture*. ETC—Urban Agriculture Programme in cooperation with TUAN and other organizations.
- Onyango, C.** 2010: Urban and peri-urban agriculture as a poverty alleviation strategy among low income households: The case of Orange Farm, South Johannesburg. M.A. University of South Africa.
- Prain, G.** 2006: Participatory technology development for sustainable intensification of urban agriculture. In van Veenhuizen, R., editor, *Cities farming for the future: Urban agriculture for green and productive cities*. IDRC.
- Rakodi, C.** 1985: Self-reliance or survival? Food production in African cities with particular reference to Zambia. *African Urban Studies* 21, 53–63.
- 1988: Urban agriculture: Research questions and Zambian evidence. *Journal of Modern African Studies* 26, 495–515.
- Rogerson, C.** 1992: Feeding Africa's cities: The role and potential for urban agriculture. *Africa Insight* 22, 229–34.
- 1995: Urban agriculture in South Africa: Policy issues from the international experience. *Development Southern Africa* 10, 33–44.
- 1998: Urban agriculture and urban poverty alleviation: South African debates. *Agrekon* 37, 171–88.
- 2001: Urban agriculture: Defining the Southern African policy debate. *The Sub-Regional Expert Consultation on Urban and Peri-Urban Horticulture in Southern African Countries*, Stellenbosch.
- Rogerson, C.** 2002: Towards 'pro-poor' urban development in South Africa: The case of urban agriculture. *Acta Academica* 1, 21–8.
- RUAF Foundation.** 2010: RUAF-FSST programme, <http://www.ruaf.org/node/1970>
- Rudolph, M. et al.**, 2009: *Food, poverty and health in three study areas of Johannesburg*. Report for African Food Security Urban Network (AFSUN).
- Ruel, M. et al.**, 2010: The food, fuel, and financial crises affect the urban and rural poor disproportionately: A review of the evidence. *Journal of Nutrition* 140, 170S–176S.
- Sanyal, B.** 1987: Urban cultivation amidst modernisation: How should we interpret it? *Journal of Planning Education and Research* 6, 187–207.
- 1985: Urban agriculture: Who cultivates and why? A case-study of Lusaka, Zambia. *Food and Nutrition Bulletin* 7, 15–24.
- Sawio, C.** 1993: Feeding the urban masses? Towards an understanding of the dynamics of urban agriculture in Dar es Salaam, Tanzania. Ph.D. Clark University.
- Shackleton, C., Pasquini, M. and Drescher, A.** 2009: *Indigenous vegetables in urban agriculture*. Earthscan.
- Shackleton, C. et al.** 2010: Production of and trade in African indigenous vegetables in the urban and peri-urban areas of Durban, South Africa. *Development Southern Africa* 27, 291–308.
- Schertenleib, R., Forster, D. and Belevi, D.** 2004: An integrated approach to environmental sanitation and urban agriculture. *Acta Horticulturae* 643, 223–26.
- Sheldon, K.** 1991: Farming in the city: Urban women and agricultural work in Mozambique. Centre for the Study of Women.
- 1999: Machambas in the city: Urban women and agriculture in Mozambique. *Lusotopie* 121–40.
- 2003: Markets and gardens: Placing women in the history of urban Mozambique. *Canadian Journal of African Studies* 37, 358–95.
- Simatele, D. and Binns, T.** 2008: Motivation and marginalization in African urban agriculture: The case of Lusaka, Zambia. *Urban Forum* 19, 1–21.
- Smit, J. and Bailkey, M.** 2006: Urban agriculture and the building of communities. In van Veenhuizen, R., editor, *Cities farming for the future: Urban agriculture for green and productive cities*. IDRC.
- Smith, P.** 2006: The diverse roles of urban agriculture: Case study of South Durban Basin, KwaZulu-Natal. Department of Agricultural Sciences, Royal Veterinary and Agricultural University.
- Smith, D. and Tevera, D.** 1997: Socio-economic context for the householder of urban agriculture in Harare, Zimbabwe. *Geographical Journal of Zimbabwe* 28, 25–38.
- Swindale, A. and Bilinsky, P.** 2006a: Development of a universally applicable household food insecurity

- measurement tool: Process, current status, and outstanding issues. *Journal of Nutrition* 136, 1449S–1452S.
- Swindale, A.** and **Bilinsky, P.** 2006b: Household Dietary Diversity Score (HDDS) for measurement of household food access: indicator guide (version 2). Food and Nutrition Technical Assistance Project, Academy for Educational Development.
- Tambwe, N.** 2006: Urban agriculture as a global economic activity with special reference to the city of Lubumbashi in the Democratic Republic of Congo (DRC). *African and Asian Studies* 5, 193–213.
- Tevera, D.** 1999: Urban agriculture in Africa: A comparative analysis of findings from Zimbabwe, Kenya and Zambia. *African Urban Quarterly* 11, 181–87.
- Thornton, A.** 2007: Beyond the metropolis: Small town case studies of urban and peri-urban agriculture in South Africa. *Urban Forum* 19, 243–62.
- 2009: Pastures of plenty?: Land rights and community-based agriculture in Peddie, a former homeland town in South Africa. *Applied Geography* 29, 12–20.
- Thornton, A.** and **Nel, E.** 2009: The significance of urban and peri-urban agriculture in Peddie, in the Eastern Cape province, South Africa. *Africanus: Journal of Development Studies* 37, 13–20.
- Thornton, A., Nel, E.** and **Hampwaye, G.** 2010: Cultivating Kaunda's plan for self-sufficiency: Is urban agriculture finally beginning to receive support in Zambia? *Development Southern Africa* 27, 613–25.
- UNDP.** 1996.
- van Averbeke, W.** 2007: Urban farming in the informal settlements of Atteridgeville, Pretoria. *South Africa Water* 33.
- van Veenhuizen, R.,** editor. 2006: *Cities farming for the future: Urban agriculture for green and productive cities.* IDRC.
- van Veenhuizen, R.** and **Danso, G.** 2007: *Profitability and sustainability of urban and peri-urban agriculture.* FAO Agricultural Management, Marketing and Finance Occasional Paper.
- Vorley, A., Fearne, B.** and **Ray, D.,** editors. 2007: *Regoverning markets: A place for small-scale producers in modern agrifood chains?* Gower.
- Weatherspoon, D.** and **Reardon, T.** 2003: The rise of supermarkets in Africa: Implications for agrifood systems and the rural poor. *Development Policy Review* 21, 333–55.
- Webb, N.** 1996: Urban agriculture: Advocacy and practice: A discursive study with particular reference to three Eastern Cape centres. Ph.D. Rhodes University.
- 1998: Urban cultivation: Food crops and their importance. *Development Southern Africa* 15, 201–13.
- 2000a: Urban agriculture: Environment, ecology and the urban poor. *Urban Forum* 9, 95–107.
- 2000b: Food-gardens and nutrition: Three Southern African case studies. *Journal of Family Ecology and Consumer Sciences* 28, 62–67.
- Webb, P.** et al. 2006: Measuring household food insecurity: Why it's so important and yet so difficult to do. *Journal of Nutrition* 136, 1404S–1408S.