

for HUNGER- proof CITIES

Sustainable Urban
Food Systems



Edited by Mustafa Koc, Rod MacRae,
Luc J.A. Mougeot, and Jennifer Welsh

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Published by the

International Development Research Centre
PO Box 8500, Ottawa, ON, Canada K1G 3H9

in association with the

Centre for Studies in Food Security, Ryerson Polytechnic University
Toronto, ON, Canada M5B 2K3

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Canadian Cataloguing in Publication Data

Main entry under title :

For hunger-proof cities : sustainable urban food systems

Includes bibliographical references.

"Most of the papers in this volume were presented at the International Conference on Sustainable Urban Food Systems, ... at Ryerson Polytechnic University, Toronto..." — p.4.

ISBN 0-88936-882-1

1. Food supply — Congresses.
2. Food supply — Developing countries — Congresses.
3. Nutrition policy — Congresses.
4. Sustainable agriculture — Congresses.
5. Urban health — Congresses.

I. Koc, Mustafa, 1955-

II. International Development Research Centre (Canada)

HD9000.9A1H86 1999

641.3

C99-980227-5

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Urban Agriculture in the Seasonal Tropics: The Case of Lusaka, Zambia

A.W. Drescher

Introduction

During 1992 and 1993, a research project on home gardening and urban agriculture was carried out in Zambia's capital, Lusaka, in peri-urban areas of Lusaka, and in rural areas of Zambia and Zimbabwe. The so-called household-garden survey concentrated on household gardens as an important part of the land-use system that seems to contribute significantly to household food security. The survey also focused on staple-food production in the city. The main objective of the household-garden survey was to clarify the role of household gardens for household food security in Zambia. In detail, the objectives were

- To determine the role of household gardens for urban households;
- To determine the contribution of the outputs of gardens to household diets and budgets;
- To draw up an inventory of the main problems encountered in preserving household gardens; and
- To find out why certain households are and others are not able to garden.

Urban development of Lusaka

Like many other cities in the developing world, Lusaka is growing fast. It had a population of 1.192 million in 1991 (CSO 1992). Since 1980 the population of Lusaka has nearly doubled. The growth rate between 1980 and 1990 was 6.1%, and the population density was 2 728 people/km² (CSO 1990). Figure 1 shows the development of the population of Lusaka since 1950.

As Figure 1 indicates, Lusaka's future need for food will be much higher. During the same period, the built-up area will increase and agricultural land will further decrease (Schlyter 1991; Drescher 1998). No township in the Western world would be able to handle growth rates of 70 000 persons/year and provide housing, education, and infrastructure. How will it be possible in the developing world? Only recently were first steps taken in Lusaka to stimulate interest in urban agriculture.

NB: This paper is based on field research for the African Homegarden Project carried out in 1992 and 1993 in Zambia and Zimbabwe. The research project was partly supported by the Food and Agriculture Organization of the United Nations' Early Warning Project and the Zambian Central Statistical Office.

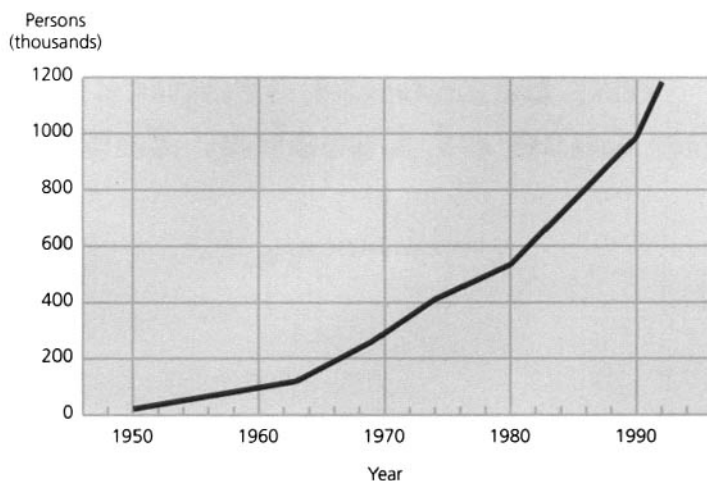


Figure 1. Population development in Lusaka, Zambia, 1950–92.
Source: CSO (1990, 1992).

Current nutritional status of Zambia's population

Among all the countries in southern Africa, Zambia shows the highest rates of malnutrition. Survey data indicate a higher prevalence of underweight individuals and stunted growth in the rural areas, both indicators of chronic malnutrition. However, wasting is significantly more prevalent in the urban areas, indicating current poor nutritional status (NFNC 1993a, b).

Protein-energy malnutrition is the most important of Zambia's major health problems, with impacts on morbidity and mortality and other long-term consequences. Iron deficiency (anemia) is also a serious health problem, as is vitamin-A deficiency (FAO 1993). Vegetables from household gardens and mixed cropping in the fields can contribute to nutrition, especially through vitamin-A content and microelements. In many cases, indigenous vegetables, gathered wild or grown, are more nutritious than foreign exotic plants (Table 1).

Where does Lusaka get its vegetables?

Agricultural activities in townships (gardening and rainy-season cropping) provide a source of vegetables of the traditional type, such as the very widely distributed *Amaranthus* spp. In 1989, a group of researchers carried out a survey of the vegetable supply of urban townships in Zambia (Ogle et al. 1990). They found that nearly 50% of the respondents practiced vegetable gardening (Table 2), mostly in the dry season.

The household-garden survey, carried out in 1992/93, showed that nearly 40% of the respondents in Lusaka still gathered wild vegetables for additional food or income (Figure 2). All of these families have gardens to augment their gathering activities. Urban households are more vulnerable during food shortages because they are unable to compensate for this through gathering. Plant resources have vanished around the urban centres.

Table 1. Nutritional value of some widely grown or gathered vegetables, Zambia.

Food	Moisture (%)	Protein (g)	Fat (g)	Ca (mg)	Iron (mg)	β -carotene equivalent (μ g)	Vitamin C (mg)
<i>Brassica oleracea</i> var. <i>capitata</i> (cabbage) ^a	93.0	1.6	0.3	55.0	0.8	280.0	46.0
<i>Amaranthus</i> spp. (cooked)	84.5	4.0	0.9	506.0	1.7	ND	ND
<i>Manihot esculenta</i> (cassava: dried leaves)	27.4	32.5	1.5	313.0	8.0	ND	ND
<i>Ipomoea batatas</i> (sweet potato: raw leaves)	83.0	4.6	0.2	158.0	6.2	5.9	70.0
<i>Curcubita pepo</i> (marrow: leaves) ^a	89.0	4.0	0.2	477.0	0.8	3.6	80.0
<i>Adansonia digitata</i> (bao-bab; dried leaves)	11.8	12.3	3.1	2.2	24.0	9.7	tr.
<i>Beta vulgaris</i> var. <i>cicla</i> (Swiss chard) ^a	92.0	2.0	0.2	132.0	0.7	600.0	50.0
<i>Lycopersicon lycopersicum</i> (tomato)	93.0	1.0	0.2	10.0	0.6	450.0	26.0

Source: FAO (1990), except as noted below.

Note: ND, no data; tr., trace.

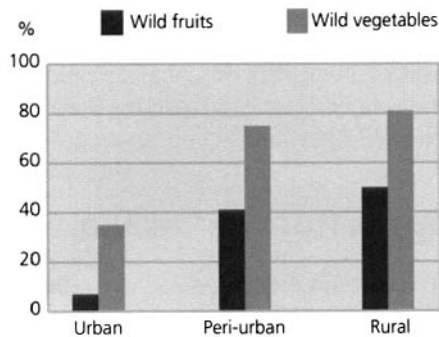
^a Data from Tindall (1992).

Table 2. Main source(s) of vegetables in urban areas, Zambia, 1989.

Source	Respondents (%) ^a		
	Lusaka	Kabwe	Ndola
Council market	79	95	70
Street vendor	62	69	57
Own garden	49	50	50
Bush	5	24	12

Source: Ogle et al. (1990).

^a Number of households: Lusaka, 82; Kabwe, 42; Ndola, 58.

**Figure 2. Gathering wild vegetables and wild fruits in urban, peri-urban, and rural areas, Zambia (n = 85 owners of household gardens).**

Source: household-garden survey, 1992/93.

Urban agriculture in Lusaka in the 1980s and 1990s

In Lusaka, as in many other tropical urban centres, gardening and agriculture receive little support from the local authorities. In fact, the city councils often prohibit these activities. Even in the drought year of 1992, with the extreme shortage of food, Lusaka City Council suppressed urban agriculture, forcing the people to slash down maize.

People practice four types of agriculture in Lusaka: gardening for food, semi-commercial and commercial gardening, and rainy-season agriculture. Rainy-season agriculture is only practiced between the end of October and mid-May. Gardening is a permanent activity, but only with a permanent water source (natural wetlands, rivers, small dams). Sanyal (1985) carried out a survey of agricultural activities in Lusaka in May–June 1980. His survey covered five of Lusaka's townships: Jack-Extension, Mtendere, Kalingalinga, Matero, and Chilenje-South. He showed that an average 13% of households practiced both rainy-season agriculture and dry-season gardening. Comparing this with data now available, one can conclude that gardening in Lusaka has increased since 1980, except in high-density areas, where no space is available for gardening.

The role of women in household food security deserves special attention. In sub-Saharan Africa, women's labour is more important than that of men in all parts of food production (Fresco 1986). Women must provide the agricultural labour needed in every phase of the food cycle to guarantee the family's nutrition, without neglecting their other tasks: food preparation, child care, fetching water and fuelwood, washing, house cleaning, and looking after the small animals. In addition, women often generate more than half of the total household income (Due 1985; Fresco 1986). The literature shows, for example, that women's income has a greater impact than that of men on the health and nutrition status of children (Maxwell 1990).

Figure 3 shows the proportion of involvement of women and men in agricultural activities in the urban environment of Lusaka. When asked about their involvement in agricultural activities in Lusaka, 42.6% of the 648 persons surveyed answered "yes, we practice gardening." And nearly 30% practice irrigation or watering in the dry season, which means gardening. Nearly 50% of the women but only 35% of the men are involved in agriculture. As Figure 3 shows, differences among the townships of Lusaka are significant. In all townships, women are more involved in agriculture and gardening than men. Involvement in agriculture means both dry-season gardening and rainy-season agriculture. The differences between dry-season gardening activities and rainy-season agriculture become obvious when one compares Figures 3 and 4. In total, only 31.6% of women and 24.3% of men practice gardening. Whereas in Chilenje and Matero, nearly 50% of the women practice gardening, their involvement in other townships like Matero, George, and Chawama is only about 25%.

Rainy-season agriculture in Lusaka

Jaeger and Huckabay (1986) found medium-sized rainy-season plots of 300 m³ in the urban area of Lusaka. The field survey carried out in 1992/93 showed that the average size had increased significantly to 423 m³ ($n = 46$) (Table 3). The need to compensate for the deteriorating economic situation since 1980 might be one reason for the increase in cultivated area. The limited land resources are fully used during the rainy

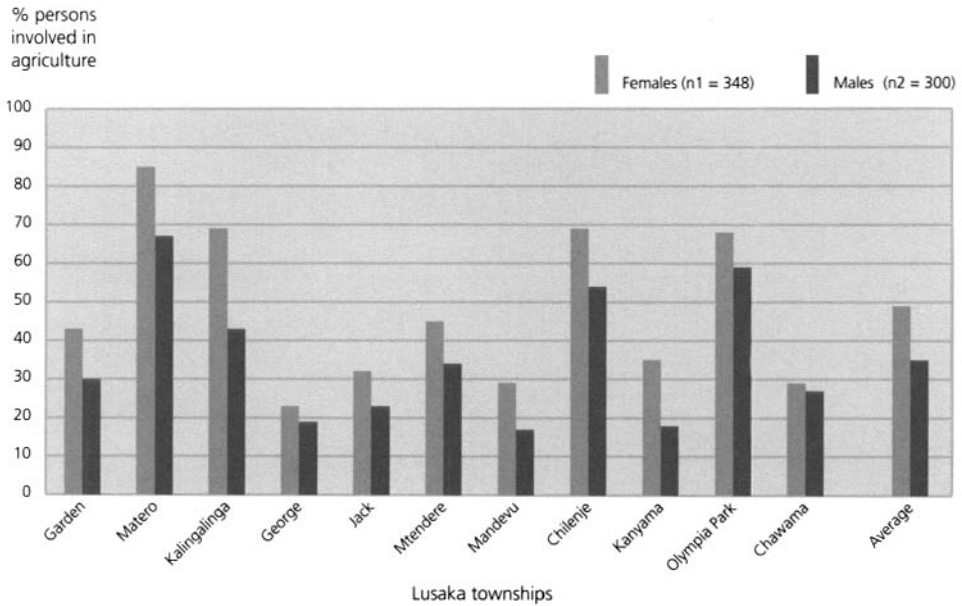


Figure 3. Involvement of women and men in agriculture in the townships of Lusaka, Zambia.
Source: household-garden survey, 1992/93.

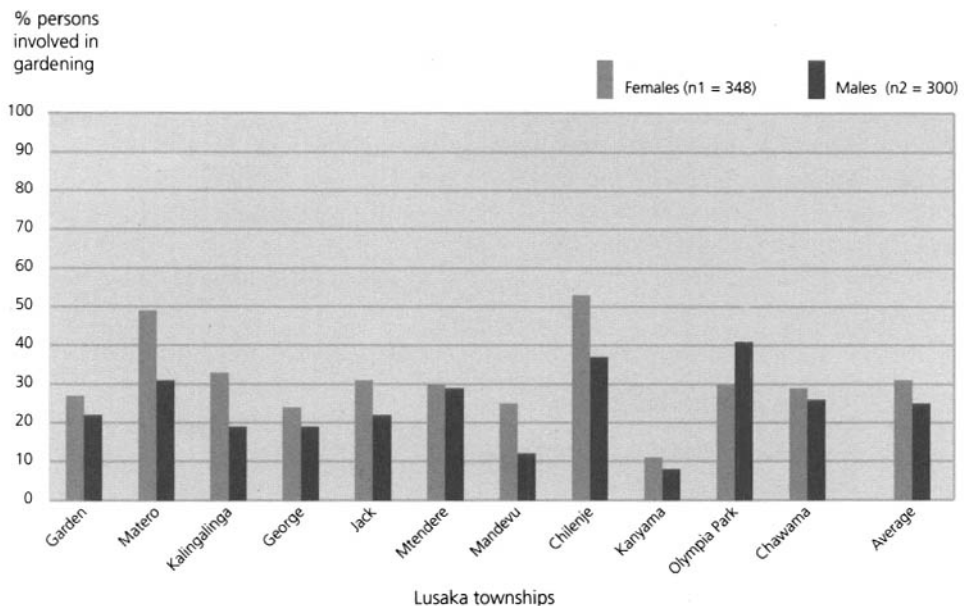


Figure 4. Involvement of women and men in gardening in the townships of Lusaka, Zambia.
Source: household-garden survey, 1992/93.

season. Public property, such as the university campus, areas around hospitals, and road strips, is used illegally for agricultural purposes.

Intercropping systems have up to four types of crop. The combination maize, beans, and pumpkin was most frequently observed. Sweet potatoes are cultivated

Table 3. Size of rainy-season plots in central Lusaka, Zambia, 1992/93.

Location	Average plot size (m ²)
Kalingalinga–Fridays Corner	571
Kalingalinga–Old City Airport	475
Great East Road, "Chainama Hill"	666
Great East Road, "Chainama Hills Hospital"	273
Ibex Hill	231
Great East Road Campus, "Dambo"	321

Source: field survey, 1992/93.

Table 4. Rainy season crops recorded in central Lusaka, Zambia, 1992/93.

Maize	Beans
Pumpkins	Sweet potatoes
Bananas	Okra
Tomatoes	Cucumbers
Groundnuts	Cassava

Source: field survey, 1992/93.

separately, on ridges. It seems that sweet potato is becoming an increasingly important crop, probably as a substitute for other staples. The household garden plays an important role as a dry-season nursery for sweet potatoes. Sweet potatoes were planted in nearly all the gardens observed. Ten types of crop were recorded for the 1992/93 rainy season: maize, pumpkins, bananas, tomatoes, groundnuts, beans, sweet potatoes, okra, cucumbers, and cassava (Table 4).

According to Sanyal (1985), urban rainy-season agriculture is practiced in Lusaka mostly by people with the lowest per capita income. But this part of the population shows the lowest percentage of involvement in gardening (according to the 1992/93 survey). This shows once again that the poorest part of the population lives in high-density housing areas, where no space is available for gardening. Other factors that prevent gardening are

- Unreliable water supply in the townships;
- Plant pests and diseases;
- Human diseases and family problems;
- Lack of time; and
- Lack of human labour.

Understanding urban agriculture — the household-gardening model

The household-gardening model (Figure 5) helps to explain at least some of the factors that influence gardening. The household itself is in the centre of the model. Internal and external factors (for example, labour availability, access or entitlement to resources, education, occupation) determine the vulnerability of the household.

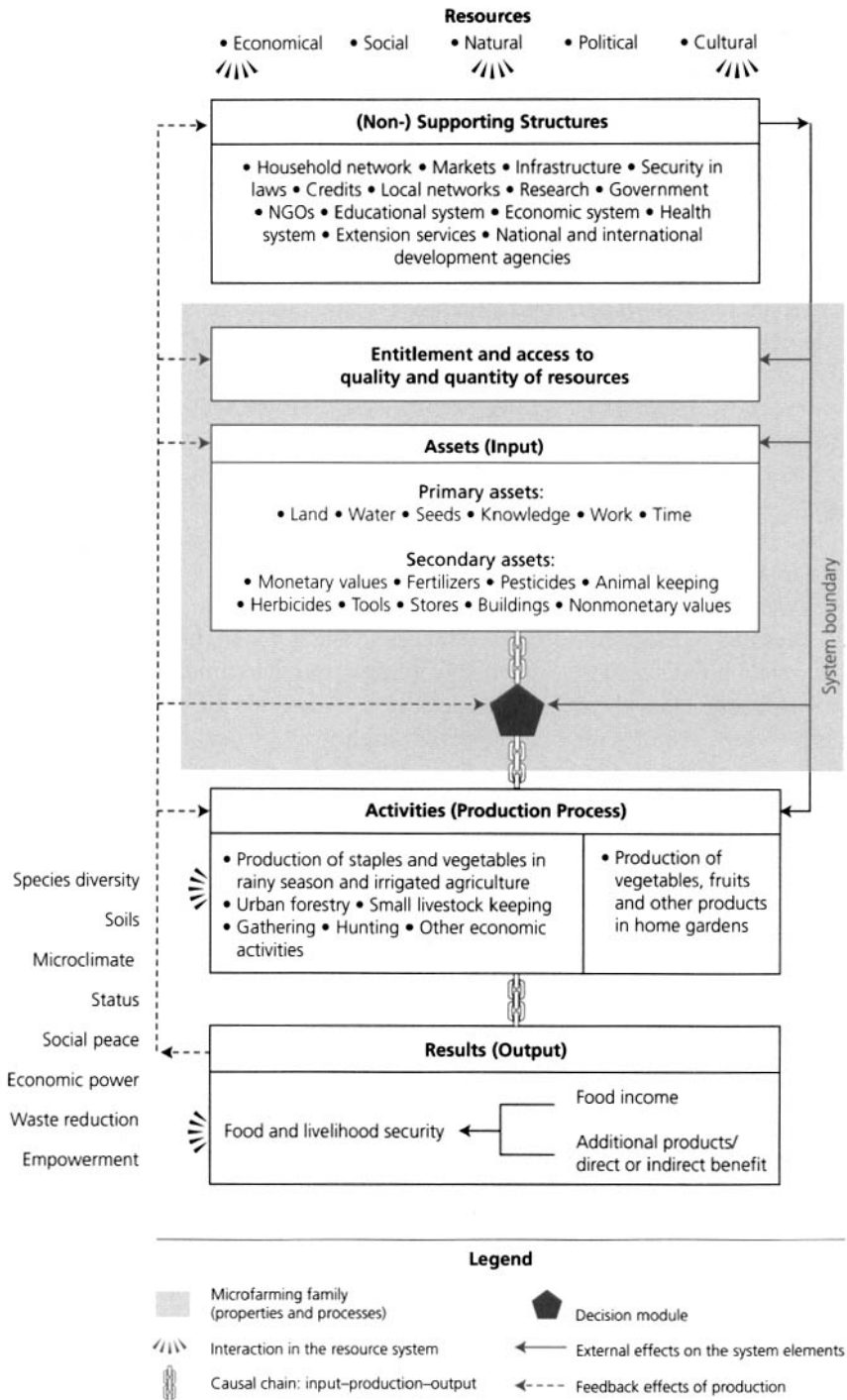


Figure 5. Household-gardening model.

Source: developed by A.W. Drescher and F. Bos (Bos 1994), stimulated by Hardon-Baars (1990), greatly altered and revised.

Undefined land tenureship and the illegality of some of the townships explain the lack of available resources such as land and water. This is a constraint on agriculture, shown by Jaeger and Huckabay (1986). Eventually, agriculture will be limited by the expansion of official and unofficial residential land use and commercial activities in the peri-urban areas. Schultz (1979) pointed out that the ring of cultivation around the central urban zone of Lusaka is likely to be pushed outward by this process of urbanization.

Analyzing the strategies and resources of households can provide more information about their vulnerability. For example, a household's access to assets is often a good determinant of its vulnerability (Chambers 1989). Kanyama is an example of limited access to basic resources like land and water. This township is one of the most densely populated residential areas of Lusaka. It was originally designated a medium-low-cost area (Jaeger and Huckabay 1986) but without outdoor space and water for gardening and, as a result of rock outcrops, very limited land resources for rainy-season agriculture. This case also shows how the poorest of the poor can be without the means to meet their basic needs, such as through gardening, because of limited resources. Household gardening, as a coping strategy for survival, cannot be practiced in Kanyama, even given the needed tools, money, and seeds. Vulnerability increases with limitations on land and water resources.

Diversity of food and income resources (cash and kind, farm and nonfarm) is one of the main buffers against vulnerability in agrarian environments. This is also true of urban environments with poor economic development and little diversity. Household gardening creates a buffer for households in three ways: it generates income, saves resources, and creates a food supply. It is vital, therefore, to any understanding of household coping and survival strategies and, ultimately, to the effective design of food-security strategies to thoroughly understand the relative importance of different income sources, their seasonal fluctuation, sustainability, etc., and the responses of individuals and households to these characteristics (Maxwell 1990).

Conclusions: recommendations for future action and development strategies

The findings of the research project showed that the basis for urban agriculture is the availability of resources. The potential for development of the urban-agricultural sector is great. The formal economic sector in urban centres of developing countries is mostly underdeveloped. Consequently, it does not provide adequate income for the urban population. Urban agriculture can act as an alternative income-generating activity and as a buffer for household food security. Policymakers should therefore consider the following recommendations:

1. Strengthen rural development.
2. Use a self-help approach to resource management.
3. Decentralize.
4. Conduct appropriate town planning.
5. Improve the water supply in urban townships.

6. Support urban composting and waste management.
7. Support programs for urban agriculture and gardening.
8. Provide support for, and research on, indigenous vegetables and crops.
9. Extend services for urban smallholders.
10. Strengthen the role of women.
11. Provide support for existing gardens and other agricultural land uses, like animal husbandry and rainy-season cropping.
12. Provide research on and extension services for the sustainable use of wild food resources.

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