

ARCHIV  
MOUGEO  
no. 116116



# AFRICAN URBAN QUARTERLY

Special Issue

## Urban Agriculture in Africa

Guest Editor  
Luc Mougeot

VOLUME 11 NUMBERS 2 AND 3  
MAY AND AUGUST, 1996

Published in March 1999

---

**AFRICAN URBAN QUARTERLY**  
**INTERNATIONAL ADVISORY EDITORIAL BOARD**

J. A. Adelamo, University of Lagos, Nigeria  
 Hycith I. Ajaegbu, University of Jos, Nigeria  
 M. A. Al Hammad, Arab Urban Development Institute,  
 Saudi Arabia  
 Guy C. Ankerl, Inter-University Institute of Geneva,  
 Switzerland  
 Elias H. O. Ayiamba, University of Nairobi, Kenya  
 Keith Baird, SUNY-Buffalo, USA  
 Salvino Busuttil, University of Malta, Malta  
 Mike B. K. Darkoh, Kenyatta University, Kenya  
 Azuka A. Dike, University of Nigeria at Nsukka, Nigeria  
 M. A. Ezz Al-Din, University of Kuwait, Kuwait  
 Roland Fuchs, United Nations University, Japan  
 Josef Gurgle, The University of Connecticut, USA  
 B. W. Hodder, University of London, UK  
 Allen Howard, Rutgers University, USA  
 B. S. Hoyle, University of Southampton, UK  
 George O. Krhoda, University of Nairobi, Kenya  
 John P. Lea, University of Sydney, Australia  
 Akin L. Mabogunje, University of Ibadan, Nigeria  
 Justice N. Mlia, University of Malawi, Malawi

Michael L. McNulty, University of Iowa, USA  
 Arcot Ramachandran, United Nations Centre for Human  
 Settlement  
 Akbar Mohamed, SUNY-Binghamton, USA  
 A. C. Mosha, University of Botswana, Botswana  
 Walter O. Okomo, SUNY-College of Staten Island, USA  
 Anthony M. O'Connor, University College, London, UK  
 Peter O. Ondiege, University of Nairobi, Kenya  
 Richard S. Odingo, University of Nairobi, Kenya  
 Simeon H. Ominde, University of Nairobi, Kenya  
 Leonard Plotnicov, University of Pittsburgh, USA  
 C. M. Rogerson, University of Witwatersrand, RSA  
 Pius O. Sada, University of Lagos, Nigeria  
 Ademola T. Salau, University of Port Harcourt, Nigeria  
 Edward W. Soja, UCLA, USA  
 Elliot Skinner, Columbia University, USA  
 Christopher J. Smith, SUNY-Albany, USA  
 Richard E. Stren, University of Toronto, Canada  
 D. R. Fraser Taylor, Carleton University, Canada  
 Peter Treuner, University of Stuttgart, Germany  
 Peter P. Waller, German Development Institute, Germany

---

AFRICAN URBAN QUARTERLY is an independent, interdisciplinary and international journal published quarterly in February, May, August and November.

*Editorial offices:* African Urban Quarterly Limited, P.O. Box 74165, Nairobi, Kenya, East Africa. *Telephone:* +254-2-216574, *Telex:* 22095 VARSITY NAIROBI, *Cable:* VARSITY NAIROBI.

*Publisher:* African Urban Quarterly Limited, P.O. Box 74165, Nairobi, Kenya, East Africa. *Telephone:* +254-2-216574, *Telex:* 22095 VARSITY NAIROBI, *Cable:* VARSITY NAIROBI.

*Editor:* R. O. Obudho, African Urban Quarterly Limited, P.O. Box 74165, Nairobi, Kenya, East Africa. *Telephone:* +254-2-216574, *Telex:* 22095 VARSITY NAIROBI, *Cable:* VARSITY NAIROBI.

*Subscription rates:* Four issues

	KENYA	OUTSIDE KENYA
Individual	US \$ 50.00	US \$ 60.00
Institution	US \$ 100.00	US \$ 120.00
Single copy	US \$ 40.00	

Special rates for students in full-time education are available on request.

Airmail postage: add US\$ 40.00

Surface mail US\$ 20.00

All payments must be made in US dollars and cheques are made payable to African Urban Quarterly Limited.

*Subscription Inquiries and Orders:*

African Urban Quarterly Limited, P.O. Box 74165, Nairobi, Kenya, East Africa.

*Telephone:* 254-02-216574; *Telex:* 22095 VARSITY NAIROBI, *Cable:* VARSITY NAIROBI

*Reprints:* Minimum orders of 50 copies are available from the publisher.

*Indexing:* Appropriate articles appearing in African Urban Quarterly are abstracted or indexed in: UN monthly Bibliography of Selected Articles; International Development Abstract; Sociological Abstract; Social Welfare, Social Planning/Policy and Social Development (SOPODA); International Bibliography of Book Reviews (IBR); Sage Urban Studies; Current Geographical Publishers; International Regional Science Review; Population Index; Anthropological Index; CIB International Construction Data Base ICONDA of the Information Centre for Regional Planning and Building Construction (IRB); Sociology of Education Abstract and African Urban and Regional Science Index.

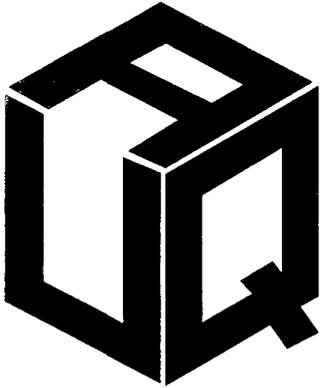
Opinions expressed in signed contributions are those of the author(s) and do not reflect those of the Editor or African Urban Quarterly Limited.

© Copyright 1996 by African Urban Quarterly Limited.

ISSN 0747-6108

The whole of materials appearing in this periodical is copyrighted and may not be reproduced in whole or in part without the permission of the Editor and Publisher, African Urban Quarterly Limited. P.O. Box 74165, Nairobi, Kenya, East Africa. *Telephone:* +254-2-216574, *Telex:* 22095 VARSITY NAIROBI, *Cable:* VARSITY NAIROBI.

---



# AFRICAN URBAN QUARTERLY

**Editor**

R. A. OBUDHO, University of Nairobi, Kenya

**Associate Editors**

MICHAEL COQUERY, Université de Paris VII, France

SALAH EL-SHAKHS, Rutgers University, USA

ALAN FRISHMAN, Hobart and William Smith Colleges, USA

J. B. OJWANG, University of Nairobi, Kenya

HARRY W. RICHARDSON, University of Southern California, USA

PAUL SYAGGA, University of Nairobi, Kenya

AFRICAN URBAN QUARTERLY LIMITED, P.O. Box 51336, Nairobi, Kenya, East Africa.

Telephone: +254-2-216574; Cable: VARSITY Nairobi; Telex: 22095 VARSITY Nairobi and Fax: +254-2-336885

ARCHIV  
MOUGEO  
116116

**AFRICAN URBAN QUARTERLY**  
Volume 11 Numbers 2 and 3, May and August, 1996

**CONTENTS**

**ARTICLES**

- **Introduction:** An Improving Domestic and International Environment for African Urban Agriculture  
*Luc J.A. Mougeot* ..... 137
- Urban Agriculture and the African Urban Food Supply System  
*Annu Ratta and Joe Nasr* ..... 154
- How Do the Urban Poor Stay Alive? Food Provision in a Squatter Settlement of Bissau, Guinea-Bissau  
*Ilda Lourenço-Lindell* ..... 163
- Urban Agriculture, Food Security and Nutrition in Low Income Areas of the City of Nairobi, Kenya  
*Alice Mbogani-Mwangi and Dick Foeken* ..... 170
- Urban Agriculture in Africa: A Comparative Analysis of Findings from Zimbabwe, Kenya and Zambia  
*Daniel S. Tevera* ..... 181
- Urban Food Producers' Decision-Making: A Case Study of Kibera, City of Nairobi, Kenya  
*Pascale Dennery* ..... 189
- The Beautiful City: Gardens in Third World Cities  
*Mary Cockram and Shelley Feldman* ..... 202
- Open Space Cultivation in Zimbabwe: A Case Study of Greater Harare, Zimbabwe  
*Davison J. Gumbo and Takawira W. Ndiripo* ..... 210
- Animal Farming in African Cities  
*Ann Waters-Bayer* ..... 218
- Urban Microfarming in Central Southern Africa: A Case Study of Lusaka, Zambia  
*A.W. Drescher* ..... 229
- Epuration et réutilisation des eaux usées domestiques en maraîchage périurbain à Dakar, Sénégal  
*Seydou Niang* ..... 250
- Farming in the City: From Analysis to Action  
*Julie van der Blik and Ann Waters-Bayer* ..... 259
- Farming in the City of Kampala: Issues for Urban Management  
*Gertrude Atukunda and Daniel Maxwell* ..... 264

**BOOK REVIEWS**

- UNDP, Urban Agriculture. Food, Jobs and Sustainable Cities  
Beacon Mbiba, Urban Agriculture in Zimbabwe. Implications for Urban Management and Poverty  
*Dick Foeken* ..... 277
- Alice M. Mwangi, The Role of Urban Agriculture for Food Security in Low Income Areas of Nairobi  
*Dan Maxwell* ..... 279
- Carlos Lopes, Enough is Enough: For an Alternative Diagnosis of the African Crisis  
*Samuel O. Akatch* ..... 281
- FAO, Supply of Livestock Products to Rapidly Expanding Urban Populations  
*G. E. Otiang'a-Owiti* ..... 283

ISSN 0237 - 3539

# THE BANGLADESH JOURNAL OF AGRICULTURAL ECONOMICS

---

Volume XIX

June and December 1996

Numbers 1 & 2

---

## Article

Effect of Education on Technology Adoption and Aggregate Crop Output in Bangladesh—*Uttam Kumar Dev and Mahabub Hossain*

Technical Change and Elasticity of Factor Demand in Rice Production in Bangladesh—*M. Kamuruzzaman, Md. Ferdous Alam and Joynal Abedin*

Changing Cropping Pattern in Bangladesh from 1971–75 through 1991–93: Implications on Crop Sector Growth—*Shamsul Alam and Md. Jaynal Abedin*

A Region-Wise Analysis of Supply Response of Cotton Crops in Punjab—*Anju Sharma and K. S. Dhindsa*

## Research Note

Adoption of Improved Practices by Potato Farmers—*M. M. Huque, M. H. Rashid and M. L. Rahman*

Economics of Japanese Quail Farming in Dhaka Metropolitan City—*S. A. Siddique and M. A. S. Mandal*

Yield, Price and Income Instability of Different Crops in Jessore District—*M. S. Alam, S. M. Elias and S. M. M. Murshed*

Demand for Fertilizer in Bangladesh. A Note—*P. C. Modak and B. K. Barmon*

Comparative Progress of Development During Pre and Post Liberation Period in Bangladesh Tea Industry—*M. S. Gazi and J. K. Saba*

---

Editorial correspondence should be addressed to the **Executive Editor**, The Bangladesh Journal of Agricultural Economics, Bangladesh Agricultural University, Mymensingh, Bangladesh. Subscription orders and business correspondence should be addressed to the **Deputy Director**, Bureau of Socioeconomic Research and Training, Bangladesh Agricultural University, Mymensingh- 2202, Bangladesh. Telephone: 091-55695 to 97 Ext. 2300

---

**The Half Yearly Journal of  
THE BUREAU OF SOCIOECONOMIC RESEARCH AND TRAINING  
BANGLADESH AGRICULTURAL UNIVERSITY  
MYMENSINGH**

## INTRODUCTION: AN IMPROVING DOMESTIC AND INTERNATIONAL ENVIRONMENT FOR AFRICAN URBAN AGRICULTURE

Luc J.A. Mougeot

Cities Feeding People Program Initiative, International Development Research Centre, P.O. Box 8506, Ottawa, Canada K1G 3H9

### Abstract

Accepted May, 1996

*The introduction submits a definition of the concept of urban agriculture, reviews some persisting myths and positions contemporary practices in a historical perspective. The sequence of contributions to this issue is discussed, with a first group documenting the role of urban agriculture within the urban food supply system and within urban poor's provisioning strategies as well as the impact of self-consumption on producer households' food security. A second and more important group illustrates emerging trends which should facilitate the growing incorporation of urban agriculture into African urban management, over the next decades. Indeed, more and more municipal governments recognise the sector as a growing urban economic function. Many are re-interpreting or revising current policies, including planning norms regarding urban agriculture (e.g., productive use of open spaces); several studies make recommendations concerning specific farming systems and their interaction with one another. More efforts are being made to tap on synergies between urban agriculture and underused urban resources (e.g., wastewaters). More public consultations are being held to resolve aforesaid policy, planning and management issues. Local authority associations and development agencies are also paying more formal attention to urban agriculture and this bodes well for future African initiatives.*

### Résumé

*L'auteur soumet une définition du concept d'agriculture urbaine, répond à quelques mythes persistants à son sujet et situe les pratiques contemporaines dans une perspective historique. On y présente les contributions des autres articles de ce numéro à la compréhension du phénomène en Afrique. Un premier groupe d'articles documentent le rôle de l'agriculture urbaine au sein du système d'approvisionnement alimentaire urbain et des stratégies auxquelles ont recours les pauvres des villes pour assurer leur alimentation, ainsi que l'impact de l'autoconsommation sur la sécurité alimentaire des ménages producteurs. Un second groupe d'articles, plus important, discutent plusieurs tendances émergentes devant accommoder une meilleure prise en compte de l'agriculture urbaine dans la gestion des villes africaines, au cours des prochaines décennies. En effet, de plus en plus de gouvernements municipaux reconnaissent le secteur comme fonction croissante de l'économie urbaine. Plusieurs en sont même à ré-interpréter ou réviser les politiques en vigueur, y compris des normes de planification touchant l'agriculture urbaine (v.g.: l'utilisation productive des espaces libres); plusieurs études font des recommandations au niveau de systèmes de production spécifiques et des ressources urbaines sous-utilisées (eaux usagées). De plus en plus de consultations publiques ont lieu pour résoudre les contraintes ci-haut présentées au niveau des politiques, de la planification et de la gestion. L'attention croissante que reçoit l'agriculture urbaine de la part des associations d'autorités locales et des agences de développement devra favoriser de nouvelles initiatives africaines dans ce sens.*

### A Definition in the Making

Mindsets and policies on urban agriculture are undergoing a notable shift within countries and among the international development community. This may reflect our latest awakening to real-world urbanisation underway in most societies since the end of World War II. The concept of 'urban agriculture' has been coming of age over the last three decades in the wake of other formerly condemned urban anomalies (e.g., 'spontaneous housing' in the 1950s through the 1970s and 'informal employment' in the 1960s through the 1980s). Originally expected to be crushed by the irresistible tides of western modernisation, spontaneous housing and informal employment actually have endured, expanded and even have come to prevail in many places; they ultimately would be

acknowledged by the more conservative publics as diverse and very robust, if not functional, components of the modernisation process. Progressive policy reforms have wisely supported their development, when not appropriating some of their elements. Predictably, urban agriculture should complete a similar genesis by the end of this century.

The concept of urban agriculture is now evolving rapidly, with far-reaching implications for the future development of urban centres in both the North and the South. Whereas initial submissions were concerned with establishing the identity of urban farming (ranges of production systems, locations, practitioners and legal status), recent interpretations have stressed its relationships with the economic, social and environmental sustainability of urban centres (food security,

---

*Acknowledgements*—I wish to express my sincere thanks to many colleagues who have either reviewed early drafts and/or provided useful materials: David Drakakis-Smith, Joe Nasr, Jean-Michel Centres, Joe Phellan, Jac Smit, Bowndin King, Chris Rogerson, Beacon Mbiba, Lood Spies and Camillus Sawio. My appreciation goes to the African Urban Quarterly for their invitation and to the International Development Research Centre for granting resources to organise this issue as well as writing time for this article. I alone am responsible for its contents.

nutritional health, employment and income generation, entrepreneurial development, open space management and waste resource reuse, gender empowerment, community development). Still, while the phenomenon is undeniable, most specialists would agree that an operational definition will need to be periodically revised out of practical experience, with concept components to be further specified to instruct local interventions.

An attempt to merge earlier with more recent emphases submits the following definition to the reader: Urban agriculture is an industry located within (intra-urban) or on the fringe (peri-urban) of a town, an urban centre, a city or metropolis, which grows or raises, processes and distributes a diversity of food and non-food products through intensive plant cultivation (horticulture and agroforestry) and animal husbandry (livestock, aviculture and aquaculture) which uses and reuses competitively urban human and material resources (e.g., household, cooperative, enterprise, corporation) mainly to the daily subsistence needs and market demand of local consumers (Ganapathy, 1983; Sawio, 1993; Smit et al., 1996a: 3).

Some misconceptions are still widespread in Africa and elsewhere, which often stem from initial directions of the literature, that the afore definition intends to correct:

- (a) Most agriculture labelled as locationally urban is actually sited in rural settings: What exactly is an urban area will vary from country to country. However, delimiting urban areas according to their field of activity rather than following jurisdictional boundaries, consistently has proven to be more useful when planning and managing urban-based activities. A wide range of criteria have been used to determine the 'urban' location of agricultural activities in Africanist literature, from land-use zoning (Mbiba, 1994: 188–202) to population density thresholds (May and Rogerson, 1994: 69–96). A need for clarity is fully justified on policy, if not on planning grounds. However, the risk is still very limited that current evidence on urban agriculture would actually refer to agriculture in rural areas. Research in Africa, Latin America and Asia (e.g.: ORSTOM, IDRC, UNU, FORD, UNDP) and development interventions (e.g.: GTZ, DANIDA, DGIS, ODA, FAO, regional banks, WB) so far have mostly targetted the larger urban centres (above 500,000 people). The literature, in fact, has been criticised for disregarding smaller centres, where the rural-urban divide often is questionable. Beyond the intra/peri-urban dichotomy captured by the definition, spatial zonations (core, corridors, wedges and peripheries) have been proposed, more useful both to explain the geographic niches of specific farming systems and to plan the spatial allocation and evolution of particular systems, during physical expansion and land-use development of the urban area (Smit et al., 1996a: 96–101).
- (b) Urban agriculture is technically not different from rural agriculture, only done at the wrong place: Although closely related, urban agriculture is distinct from rural agriculture and interacts with it in many ways. Both originally share common technologies and biogenetic pools, complementary commodities and a few production scales, systems and consumption markets. However, urban agriculture is typically much smaller-scaled and more spatially dispersed than rural agriculture; this affords more intensive, integrated, flexible and adaptive farming. Urban agriculture tends to be technically more efficient, tapping on economies of agglomeration in urban centres—information, expertise, infrastructure, inputs, services and specialty markets—which are unmatched in most rural areas. Urban dynamics press upon urban agriculture a measure of mobility and organisation again unparalleled in rural areas; this is because in urban centres farming needs to compete or combine with a variety of other land uses, to avoid or overcome more severe ecological stress and respond swiftly to shifts in demand for perishable specialties (Smit, 1980: 499–506; May and Rogerson, 1994: 90). Urban dynamics constantly transforms urban agriculture, impressing on it an opportunism and adaptability unparalleled in rural agriculture.
- (c) Urban agriculture is nothing more than a euphemism for horticultural gardening in the urban centre: Initial surveys by French geographers in West Africa and most UNU Food-Nexus Programme surveys of African urban centres did emphasise this visually more impressive form of urban agriculture (Vennetier, 1961: 60–84; Sanyal, 1986; Diallo and Coulibaly, 1987; Tricaud, 1987 and Schilter, 1991). However, UNDP's survey commissioned to The Urban Agriculture Network (TUAN) in 1991–1992, identified over 40 different farming systems and their variants, each with its own technology, investment needs, yield rates and returns to labour and risk (Smit et al., 1996a: 107–134). More recent publications recognise the diversity of African urban gardens and address a range of non-horticultural systems (Centres, 1992; Sawio, 1993; Egziabher, 1994: 85–104; ENDA-Zimbabwe, 1994; Greenhow, 1994; Lee-Smith and Memon, 1994: 67–84 and Drescher, this issue).
- (d) Within any given zone of a city, urban agriculture is mainly carried out in residential backyards: Most surveys show that residential backyards actually support only a small share of the full activity underway in any given urban centre or within each household. Ground-level land availability is particularly limited in low-income, high-density districts where the numbers of off-plot producers are larger. The UNDP survey identified seven large types of space based on tenure and site characteristics (home spaces: back, side and front yards, basements, sheds, rooftops, patios, balconies, walls, windowsills, doorsteps, plastic tubes and sticks; community spaces; surplus or reserve public and private spaces; roadsides and other rights-of-way; streamsides and floodplains; wetlands and water bodies and steep slopes). All these venues have been observed to be intensively used in African urban centres (Freeman, 1991; Maxwell, 1994: 47–66; Gumbo and Ndiripo; Dennery and Drescher, this volume). Because urban agriculture is much more than a residential land use, it is practised in synergy with a wide range of

other land uses, commercial, recreational, transportation, manufacturing, institutional, infrastructure or utility-related.

- (e) Urban agriculture is largely an informal, when not illegal, survival strategy of the urban poor: Although most urban agricultors produce for household subsistence, surveys consistently show that all income groups and many public institutions and private companies practice some urban agriculture, with varying shares of their food and non-food output being marketed locally, when not nationally or internationally (Mvena, Lupanga and Mlozi, 1991; Drakakis-Smith, 1992: 258–283; Sawio, 1993 and Maxwell, 1994: 47–66). Better-off groups are increasingly organising the production of poorer practitioners when not employing them directly or indirectly through outsourcing (Drakakis-Smith, Bowyer-Bower and Tevera, 1995: 191). With growing competition for urban agricultural inputs and services, surveys consistently show that the poor's access to inputs, support and benefits is disproportionately curtailed (Mlozi, 1993: 105–128); urban agriculture is not easily affordable by the poorer and more recent arrivees to cities where it is well-established.

There is anecdotal evidence of workers' mobility from other sectors or occupations into and out of urban agriculture, though there seems to be a tendency for people to cumulate urban farming with other occupations; there is also anecdotal data on mobility within urban agriculture. But overall, systematic accounts over a range of socioeconomic groups and farming systems during a period of years await further investigation. More studies refer to employment generated by urban agriculture in activities which either provide inputs or use its outputs, in the rest of the urban economy, (Schilter, 1991; Groupe de Recherche et d'Échanges Technologiques (GRET), 1991; Greenhow, 1994; Drakakis-Smith, 1995; Lourenço-Lindell, this issue).

### Contemporary Urban Agriculture in Historical Perspective

As our planet becomes predominantly urban, the world cities' 'corporate memory' is acquiring new relevance. It enables us to gain perspective on our current crises and to inventory how we have applied human intelligence to cope with the needs of an urbanising humanity, in very different cultures and economies. The reasons for and ways in which much urban agriculture was promoted in past societies bear strange similarities with its resurgence on the eve of the 21st century.

The gathering evidence, with pre-colonial African urbanism still comparatively under-documented, shows how extravagant was the attempted divorce between urban centre and agriculture, advocated in 18–19th century western Europe and its colonies. Le Goff (1984: 331) asserts that the urban centre-countryside contrast was stronger in Medieval Europe than in most other societies and civilisations. Yet, he found that the Medieval urban centre contained within its walls vineyards, gardens, pastures, fields, cattle and manure. Gathering trends at the end of this century point to the

unsustainability of this divorce in the face of new urban challenges, particularly in sub-Saharan Africa.

Urban agriculture is probably as old as the first great urban centres built by our ancient civilisations. What is urban is historically or culturally defined; what ancient civilisations considered to be urban do not fit our contemporary reality, just as our definitions may not fit the urban reality of future civilisations. What is striking, however, is that, no matter what definition prevailed, throughout history and across civilisations, food production in urban settlements has not been exceptional or temporary.

Investments were made into massive and ingenious earth- and waterworks within and fringing ancient urban settlements. These were used wholly or partly to grow shrubs, vegetables, fruits, ornamental, medicinal and other utilitarian plants for food, feed, storage, wood and fuel, building materials, shade, fencing and windbreaks, and to raise livestock for food, materials, traction, transport, trade, sacrifices and status.

Ancient agriculture was not sited haphazardly in the urban fabric or disconnected from the rest of its economy. Urban food production took a variety of forms, making efficient use of space, site conditions, closeness to amenities, services and resources. Urban centres combined production and storage areas (Knossos), associated walled gardens with hydraulic facilities (Thebes, Egypt) and fed livestock with brewery refuse (Akhenatan, Egypt) (Warren, 1994: 46–51; Jellicoe, 1989: 25 and Courtlandt and Kocybala, 1990: 126). Some urban centres built vaulted aqueducts which gravity-conveyed water from underground cisterns to terraced cropfields (Eleutherna, Crete) (Rodenbeck, 1991: 91). Roman coastal urban centres linked their harbour by channels to lagoon-based fish-farms for local consumption and export (Cosa), as still practised today (Orbetello, Italy) (McCann, 1994: 95–96). Across the Atlantic in pre-Columbian America, coastal centre authorities ordered the drainage of swamps and immense waterworks supported a highly organised agriculture (Edzna, Mexican Campeche) (Hammond, 1994: 132). Needless to say, a growing number of contemporary urban centres are reusing treated and untreated municipal wastewaters to irrigate woodlands, orchards, pastures, grain crops, produce and fish (for an international overview see Edwards and Pullin, 1990; Moscoso on Lima, 1995; Thang on Hanoi, 1996; Niang on Dakar, this issue).

Urban agriculture does not appear to have been socially demeaning or technically primitive in past civilisations. Major political centres sited on wetlands (Teotihuacan) reclaimed extensive areas through raised-beds anchored with fences of willows, filled in and periodically fertilised with marshy vegetation and topped with canal bottom; these carried fruits, vegetables, trees and houses (Coe, Snow and Benson, 1986: 104). Transplanting from reedbeds afforded multiple harvesting and animal and human manure was recycled into organic gardens (Redclift, 1987: 109–110). At urban centres clawing on to mountain slopes (Buritaca 200, Colombia; Cuzco and Machu Picchu, Peru), extensive retention walls, terrace gravel beds and stone-lined drainage afforded intensive farming on steep slopes (Coe, Snow and Benson, 1986: 166–167 and Butland, 1976: 162). In the late 1800s, Paris still had 5,000 people working 860 hectares of highly

productive market gardens which recycled and composted human and animal waste and used irrigation, raised beds and glasshouses, supplying two million Parisians with fruits and vegetables and exporting excess to London (Girardet, 1992: 52).

Food provision was an enduring concern of urban populations and their administrations, given urban centres' vulnerability to insufficiency or disruption of imported supplies, hence to hunger or even famine. Roman authorities of fast-growing urban centres commissioned complexes of garden houses likely for middle and lower class households (Ostia, Rome) (Watts and Watts, 1994: 86–89). Barbarian invasions during the High Middle Ages would teach local governments the need to strengthen food self-reliance when rebuilding urban centres later in the period. This happened even before then: when substituting themselves to urban centres, monasteries developed as semi-autonomous units stressing food self-reliance (Guidoni, 1981: 42). For instance, the 9–10th century plan of Saint-Gall monastery at Fontenay, Cluny, clearly shows specialised quarters for herborists, gardeners, poultry yard, cowboys, sheep, pigs, goats, horses, cows and latrines (Le Goff, 1984: 144–145).

In the 8th century, Rome was growing again and faster than it could feed itself. Pope Zaccharias' (741–752) plan to repeople and rebuild the city included five 'domus cultae' or large farms, near main arteries several miles apart one from another, all around the city; six would be implemented by Pope Adrien I by century's end, one of which entirely to feed the mass of workers needed to repair and restore Rome's infrastructure (Guidoni, 1981: 98–99). Elsewhere, icons of important cities, such as Novgorod or Cologne depicted well-spaced housing, gardens and orchards, some fenced up to keep out small livestock, located within inner and outer walls (Guidoni, 1981: 113; Jellicoe, 1989: 34; Yanin, 1994: 123). Several contemporary African urban centres are making efforts to set aside zones for peri-urban food production and some are establishing these on wedges close to high-density, low-income districts. Planned peri-urban market gardening is well-developed in Asian urban centres.

Throughout most of mankind's history and in quite different cultures and climates, urban dwellers have engaged to varying extents in producing some of the food they require, close to or at their own residence, within or fringing urban centre limits. Food production has not only been carried out by better-off households; those in authority often have commissioned, built and managed massive food-producing systems, even incorporating food production into the design of modest living quarters.

Pre-colonial African urbanism remains under-researched, to say nothing of urban agriculture. Ancient and Medieval urbanism seems to have been well-advanced in West Africa and medieval reports on African urban centres pointed to the major role of agriculture in what were low-density, shifting urban centres with important political functions. In West Africa, intensive peri-urban farming enabled urban centres to achieve near food self-sufficiency in the face of climate constraints to long-distance transportation and long-term storage and little dependence on trade for daily food supplies. It was even more important in Eastern and Central Africa,

where often open-space wedges between residential quarters were cultivated (a practice resumed in post-colonial capitals either spontaneously or with external support in recent years) (Winters, 1983: 14–15). Historical accounts are fewer of urban horticulture in higher-density, more trade-bound cities under Islamic influence, but other forms of urban agriculture, such as aquaculture in coastal ports or animal husbandry in arid regions, were probably quite important, as observed in contemporary cities.

Neglected by 20th century development agencies, urban agriculture historically has interacted with rural agriculture to the mutual benefit of both. From the evidence, many ancient urban centres probably provided the incentives and testing grounds for specialised, intensive farming systems. Some advances have been borrowed by urban agriculture, adapted, tested and devolved back to rural agriculture. Technological breakthroughs in ancient urban centres have included sun reflectors, water collection, storage and conveyance; frost protection, wetland drainage and slope terracing. Large-scale canal networks clearly seem to have followed the advent of fully established urban centres (Adams, 1994: 15). Even today, urban centres serve as diffusers of more efficient greenhouse, aquaculture, hydroponics and dairying technologies to rural areas (GRET, 1991 and Marulanda and Izquierdo, 1993).

The divorce of agriculture from urban centres and of food production from urban economies is very recent in our urban history. It also has not been universal. It may date back to the European Renaissance, having spread throughout Western Europe in the 18th century and becoming entrenched by the late 19th, when it also started to be introduced in European colonies. In colonial Africa, gardening and some animal husbandry were often permitted on private plots but official initiatives were minimal for incorporating food and fuel production into low-income housing plans into the management of institutional estates and public open space or into urbanwide zoning. In East Africa, Kironde (1992: 1277–1292), Lee-Smith and Memon (1994: 67–84) and Mbiba (1994: 188–202) have reviewed the sanitary and ethnic justifications for a colonial legislation largely inimical to urban agriculture.

In the last 20 years urbanisation has been challenging the practicality of urban centres' exclusive reliance on distant, costly and unreliable rural food production, domestic and foreign. Urbanisation has also been challenging the morality of depriving the urban poor from accessing idle urban land for feeding themselves and others. As the sanitation-without-agriculture approach is failing to solve the urban waste management crisis, urban authorities worldwide are again turning their attention to the sanitation-with-agriculture option as witnessed by the planning of a 1996 World Bank Symposium on the subject. The urban centre/agriculture divorce is showing signs of weakening both in the North and the South.

### **Trends in African Urban Agriculture: This Issue in Context**

Surveys show that since the late 1970s, urban farming has been growing in many countries, in terms of practitioners,

space used, contribution to household welfare and to the urban economy in general (Mougeot, 1994a; Tevera, this issue). A plethora of factors explain this growth: rapid urbanisation, crippled domestic food-distribution systems, national policies harmful to domestic production, reduced public spending, subsidies and wages, retrenchment of formal employment, soaring inflation and plummeting purchasing power of middle class, lax urban regulatory enforcement. Civil strife, war and natural disasters also disrupt rural food production and supply lines to urban centres. Recent studies have further linked the growth of urban agriculture to structural adjustment programmes and major currency devaluations in the late 1980s and early 1990s (Drakakis-Smith, 1995; Shapiro, Ehui and Fitzhugh, 1995: 109–119; Lourenço-Lindell; Atukunda and Maxwell in this issue). Conditions sufficient to dampen the resurgence of urban agriculture appear increasingly unlikely in most of Africa.

### **(1) The Role of Urban Agriculture in the Urban Food Supply System and in the Urban Poor's Food Provisioning Strategies**

Three contributions to this issue initially position this resurgence of urban agriculture within African urban food supply systems and the African urban poor's food provisioning strategies, as well as the impact of urban agriculture on self-producing households' nutritional health.

The first article of this issue by Joe Nasr and Annu Ratta, outlines the recent and future growth of urban farming in sub-Saharan Africa's urban food supply systems during rapid urbanisation. All system components as defined by Drakakis-Smith (1990: 100–120), including food-producing areas (domestic rural and urban and foreign), marketing networks and urban consumption centres, are affected in quantity and quality during urbanisation. The ability with which the marketing network responds to urbanisation (growing spatially more concentrated and qualitatively changing food demand) affects the relative mix of acquisition methods (exchange, production and transfer) among different income groups and the system's geography of supply areas. While networks evolved from petty and small-scaled to capitalised and large-scaled in developed countries, the authors contend that in the developing world the traditional supply structure often overlaps with the new structure. It is this development which accommodates the resurgence of urban agriculture, big and small, in the African urban food supply system.

The mix of acquisition methods and of supply areas is mediated by several policy and technology factors, both positive and negative. According to Nasr and Ratta, several macrotrends will sustain urban agriculture's growing role during the next 30 years or so, particularly in sub-Saharan Africa. The fastest urban growth will occur in those countries least equipped to feed their urban centres; within less than a generation, African urban centres will contain as many people as the whole continent holds today. This will take place despite lagging economic growth and slow development of marketing networks; a gap is widening between population growth and staple-cereal production growth, in the face of limited foreign exchange for imports to make up for deficits.

Urban poverty and food insecurity will expand considerably for several factors, from demographic to fiscal.

Strategic to urban agriculture's functionality in the African urban food system are the ways in which marketing networks try to adapt to urbanisation under several constraints and opportunities. Because demand is ruled more by affordability than availability, it can be assumed that different income groups will resort to different mixes of acquisition modalities, jointly determining the relative contributions of rural, urban and foreign production areas. Although acquisition and production are interrelated, these have usually been treated as different worlds in the literature. The second article of this issue, by Ilda Lourenço-Lindell, attempts to correct this gap.

Lourenço-Lindell focuses on the growing urban poor population and analyses household food consumption together with household involvement in food production and distribution. In order to do so she uses a broadened concept of entitlement which encompasses, beyond possession-based entitlements, other behaviours rooted in social and cultural codes, such as charity and safety networks, institutional conditions and illegal practices.

This approach enables Lourenço-Lindell to document the direct contribution of urban agriculture to provision strategies through self-production for subsistence and sales. It indicates how central urban self-production can be to such strategies, through the many ways in which producers may be influenced (mutual help among producers, community welfare and funerals groups) and may participate in formal and non-formal channels of acquisition in the urban food supply system. Farmers generate employment and additional/seasonal income for other basic needs (processed food), link up with the food trade, produce foodstuff otherwise unaffordable, reduce dependence on purchased food, enhance their own exchange entitlement, provide food gifts and meal sharing. They also, although unwillingly, contribute to food insecurity mitigation through theft of their crops, animals and assets by third parties, a problem far from insignificant in several surveys.

Urban food security has been shown to deteriorate in several urban centres of the developing world, being often worse than in rural areas among low-income people (von Braun, McComb, Fred-Mensah and Pandya-Lorch, 1993). Urban agriculture is commonly argued to improve the urban poor's food security. However, few studies so far have examined its actual impact on nutritional health of producer households. The third article of this issue, by Mboganie Alice Mwangi and Dick Foeken is on Nairobi and supplements an earlier study in Kampala (see Atukunda and Maxwell, in this issue). In both studies non-farming control groups were used; Kampala focused on anthropometric measurements while Nairobi added quantified nutrient intakes. In both cases, farming households justified their activity for their need of food, regardless of other employment. In Nairobi, while all groups had inadequate energy intake, the percentage of households with inadequate protein intake was highest in the non-farming group and differences in average intake between farming and non-farming groups worsened when correcting for household size. The higher energy and protein intake of

farmers resulted from self-production (these were even better-off materially though their cash incomes were comparable to those of the non-farming group—thanks to their reduced food purchases). Measures of nutritional health for children (weight-for-height and weight-for-age) showed similar patterns favouring the farming group and this group's lead even increased when controlling for age distribution. Although averages among the three groups do not vary much, these hide very different distributions of data; malnutrition is less widespread within the farming group.

## **(2) Incorporating Urban Agriculture into Urban Management; Trends in Africa**

Several trends are underway on the continent which bode well for the incorporation of urban agriculture into African urban management policies well into the 21st century. A second group of contributions to this issue reflect some of those trends.

**(a) More African Urban Governments are Recognising Urban Farming as a Permanent and Growing Function of the Urban Space Economy.** Recognition is a requisite for legitimation, legislation, promotion and regulation. As opposed to ignorance or denial, recognition implies a conscious association of concept with empirical observation. Even though a local authority recognises urban agriculture, it may not necessarily approve or endorse all or even part of it; however, recognition usually has been associated with greater support to 'legal' farming, even greater tolerance of 'illegal' farming. When producers agree that 'illegal' farming is strictly transitional where it is practised, councils often have been able to accommodate these as prelude to planned development, without violating or having to modify prevailing bylaws or zoning plans. The Harare City Council does tolerate, in council housing projects, the cultivation by residents of vacant land slated for non-residential use while this land awaits development. Additionally, the extensive cropping of roadsides, public playgrounds, parks and police stations witnessed throughout high density districts during 1996 (May) rainy season testifies to the absence of any significant repression by local authorities.

The process by which local authorities come to recognise urban agriculture are still unclear and Joe Nasr suggests more research is needed to clarify processes which lead to such attitudinal or practical changes. Which are more determinant: self-reliance in the face of national crises (wars, droughts and structural adjustment), external funds and visibility afforded by international humanitarian projects, powerlessness against beyond-point-of-no-return scale which the activity may have reached urban centrewide, eagerness to emulate 'more advanced' urban centres, key decision-makers' own first-hand experience with urban agriculture (many are farmers themselves) and its effectiveness to alleviate poverty and mitigate malnutrition or famine in his/her family, neighbourhood, riding?

Surveys during the 1980s have contributed to estimate, characterise and publicise the industry, putting numbers on people involved, areas used and value of output, contribution to household economy. These and subsequent surveys

recently have been inclining local authorities to realise the scale of the activity and revise earlier dismissals as a short-lived import from rural culture. Very few urban centres otherwise possess and publish statistics on local urban agriculture; existing records are dispersed among agencies, largely underestimating informal activities and excluding some product categories, scales of production and areas of the urban centres. Still, early official initiatives date back to the 1970s and even before, prior to the publication of the first surveys by the United Nations University and the International Development Research Centre of Canada.

A case in point are East African surveys, which have resounded differently among official circles depending on which country is considered. The fourth article of this issue by Dan Tevera, introduces the reader to surveys in several eastern African urban centres. It notes that information available on the considerable growth of urban agriculture in Zambia, Zimbabwe and Kenya should be used to draw lessons as urban agriculture spreads to other countries of the region. Research on the spatial extent and location of urban agriculture, socioeconomic characteristics of the cultivators and the economic importance of the activity, is found wanting of more attention to rural-urban linkages (see Lewcock on Kano, 1995: 225–234) and to the relationship between urban agriculture, waste management and human health (Niang on Dakar, this issue). Despite the spatial growth of urban agriculture, the poor do not benefit much from it and most urban farming remains officially unsupported. Tevera advocates that urban farming be encouraged under controlled conditions. This is the approach which most known local initiatives underway in the region seem to be adopting (Sawio, 1994; Gumbo and Ndiripo; Atukunda and Maxwell, this issue).

**(b) A Review of Policy and Planning Options Often Follows Official Recognition of Urban Agriculture, Leading to Conditional Legitimation of Existing Activities, to Incorporation of New Activities into Planning and to the Regulation of Both Current and Planned Activities.** Changes in policy have tended to precede changes in planning. Policy changes are found in politicians' statements, councils' actual interpretation or enforcement of bylaws and promotion of practical initiatives on social or humanitarian grounds. In times of hardship, presidential and local governmental declarations (e.g., Zambia, Tanzania, Zaire, Zimbabwe) have urged people to become more self-reliant in rural and urban areas. Support from local technocrats has often been lukewarm; however, electoral processes in newly independent countries have been making ministers and councillors more accountable to their constituencies (e.g., Uganda and Zimbabwe); interventions have become more sustained and comprehensive.

Between 1975 and 1985, governments in six African countries supported communal gardening: Mozambique (land provision), Ethiopia (water, seeds and fertilisers), Zaire (garbage composting, nutrition education and coops to streamline marketing), Morocco (tax exemption), Zambia (land tenure to squatters for home food production), Kenya (nutrition awareness and income generation with crops)

(Wade, 1987: 38–41). The new capitals of Côte d'Ivoire, Malawi and Tanzania have been designed to accommodate urban agriculture and their authorities are encouraging it. Sectoral studies on urban agriculture provided grounds for revising master plans of major existing urban centres which in turn offered the framework for practical initiatives as in Maseru, Lesotho (Greenhow, 1994: 2) and Kampala, Uganda (National Environment Information Centre, 1994; Atukunda and Maxwell in this volume. The 1975 revision of the 1968 master plan of Kinshasa set aside areas for horticulture in the east, central and southwest sections of this city and provided the framework for support programmes aforementioned (Pain, 1985: 34). In Durban, Republic of South Africa's second largest city, a metropolitan open-space system developed out of a 1983 joint study between the City's Engineer Department and the University of Natal, now links nine municipal parks and incorporates urban agriculture programmes for food and income (Roberts, 1996: 5–6).

It is becoming clear to a growing number of urban governments that colonial regulations (environmental and sanitary) and prohibitive bylaws have remained largely unenforceable, while in-field repression (harassment, slashing and eviction) is becoming less dependable on humanitarian and political grounds. More governments realise that disregard, outlawing and persecution have undercut proclaimed intentions: much urban agriculture has had to develop under conditions now revealed as ecologically degrading, sanitarily unsafe, technically inefficient, socially inequitable and economically exploitative.

Crucial to enlightened policies and programmes for urban agriculture is an intimate knowledge of urban farmers' decision-making. Very little of this has been researched so far and the fifth article of this issue, by Pascale Dennery, precisely focuses on poor producers' use of open spaces and their decision-making in Nairobi, Kenya. Her findings carry very practical implications; policy-making can be less than appropriate if it does not account for local conditions influencing producers' rationality.

For instance, large households assign at least one member mainly to food production; it follows that self-production is a socially valued use of labour time and that repression among certain groups can severely undermine their food security. Multiple-plot farming is an accepted practice because it enables households to spread theft, eviction or bad-crop risks; it also affords a diversified or more continuous production. These are arguments for the acceptance of dispersed farming, a condition which should increase and facilitate land provision urbanwide for urban agriculture.

An important observation in Kibera is that most open-space producers are *de facto* tenants abiding by customary usufruct principles, not land-grabbers. And producers mainly dependent on urban agriculture stand to lose the most if evicted. These two findings suggest that producers may be willing to consider usufruct without ownership (public-private partnerships); also some indemnification of legitimate occupants is in order where displacement cannot be avoided, particularly for those more dependent on the activity. Kinship, ethnicity and belonging to the right social networks were found to be crucial to accessing production inputs.

Programmes should prioritise newcomers and projects should be sited so as to use and protect, if not reinforce, current local networks.

Households fully dependent on food self-production are uncommon, but self-production is key to household maintenance; its availability greatly affects the household's spending pattern. Hence, urban farming programmes should be promoted among certain groups for their use value and fungibility benefits at least as much as for the exchange value of their products. Urban agriculture may also increase women's financial independence and their control on related income may buffer poor decision-making by other members of the household. However, control of production is not automatic but rather follows from self-esteem and perception: assistance should further the development of women's true worth and contribution to household livelihood.

Dennery also found that assistance for non-agricultural tasks which enables the producer to devote more time to farming is easier to obtain than for plot-tending; so actions particularly aimed at women producers, which stress household-related cooperatives (child-care, cooking or water-provision) can greatly improve farming labour allocation and productivity.

Producers do collectively engage in low-cost interventions to mitigate or avoid urgent threats to their activities. This is not uncommon on other urban issues: popular organisations are extremely plastic, coalesce and dissolve around specific emergencies. Attempts to introduce permanent, formal participation models from highly structured civil societies have too often failed because they ignore that informal ways are the people's response to costly, ineffective and often corrupted formal organisations found locally. Dennery rightly warns that higher-level producer organisations will only succeed if they fully understand and build on the existing organisational culture: For instance, many organisational forms are not strictly food production-oriented, which were observed to actually support it variously in Kibera, and vice-versa.

**(c) More Urban Centres are Reviewing and Adapting Assimilated and Acquired Technical Planning Norms Affecting Urban Agriculture.** This is where enabling policy trickles down into official supporting practice. Beyond the inclusion of urban agriculture into master plans or sporadic social/food emergency interventions, more urban centres are creating permanent institutional programmes and agencies and stressing synergies between urban agriculture and other activities within broader urban action plans. This responds to a need for indigenising African urban planning (Kironde, 1992). As synergies between urban agriculture and other urban sectors are valued, concepts need to better reflect and serve local conditions; standards need to be modified beyond urban agriculture, extending also to sanitation, water and housing supply as well as urban transportation.

More researchers are exploring zoning modalities for a smooth transition from rural to urban land-use on the urban centre's fringe. This includes flexibility to allocate, displace, upgrade, possibly combine or integrate urban agricultural functions with other land uses as the urban centre grows. In

addition to the on-plot residential gardening, many urban centres are adding communal programmes of urban agriculture, namely, through the productive use of open space, (e.g., horticulture and animal husbandry in peri-urban greenbelts) as in Maputo (Wolfgang Stiebens, personal communication December 1995) and Durban (Roberts, 1996: 5–6). Secondary urban centres have often innovated, with various forms and degrees of support in Kenya (Lee-Smith and Memon, 1994: 83), Tanzania (Mvena, 1986), Ivory Coast (Della, 1991) and South Africa (Rogerson, 1993: 25–26). The City of Gweru, with the assistance of a national agricultural extension agency, identified undeveloped council land suitable for agricultural activities, divided it into small plots and leased these out to producers for a nominal fee on a yearly basis (ENDA-Zimbabwe, 1996: 13). Early provisions should enable these small cities to manage further growth more effectively.

Urban governments are also addressing, with growing involvement from non-governmental stakeholders, the need for improved tenure or usufruct stability. Creative leaseholds (i.e. non-residential, purpose-specific as tried successfully in the North and the South) encourage knowledge and material investment by farmers into land conservation, productive technologies and profitable crop selection. They also legalise farmers' activity, entitling them to credit and technical training and assistance, crop protection and investment indemnification. In Tanzania, the National Insurance Corporation will soon extend a livestock insurance policy to urban areas (Camillus Sawio, personal communication, May 1996).

Reflecting the growing interest for group forms of agriculture on open spaces, the sixth article in this issue by Mary Cockram and Shelley Feldman emphasises communal gardens, cooperative farms and market gardens. This may be relevant to African urban centres which need to cope with sizeable social/food security challenges and can capitalise on traditional agrarian institutions and accommodating urban centre layouts.

The private home-plot garden is legally endorsed in most countries and firmly established among high- and mid-income groups. In Dakar, however, one NGO had to stop supporting backyard gardening as it was considered off-zoning and producers were threatened with fines by public health inspectors. It should be promoted wherever possible in new housing schemes (Greenhow, 1994). Under prevailing low-income housing patterns and until confined-space technologies become widely available to the poor, the contribution of backyard gardening to the poor's urban food security will remain limited.

Most urban poor have little land of their own to produce the food they need. But surveys reveal an enormous amount of public and institutional, even private, land available at any one time for food production (unbuilt or unconstructible). Communal forms of land tenure or usufruct have much potential to improve the poor's access to urban agriculture, where open-space cultivation is already widespread or rapidly growing. Community spaces and surplus or reserve public and private spaces (utility and institutional estates included) are prime candidates to group forms of urban agriculture. City council departments in Harare and Durban have been

running farming cooperatives for some time; several public-private partnerships are already at work: in Lomé (port facilities), Dakar (water utility concessions), Durban (health clinics and factory premises), Dar es Salaam (church group estate), Morogoro (university campus). These need to be evaluated and disseminated to other urban centres, as synergies with other land uses can create win-win solutions for partners, with economies of scale to producer groups likely to benefit consumers as well.

An important point made by Cockram and Feldman is that although group forms of gardening may take place on communal land, this is not automatic. Several urban centres in the region insist on the need for farmers to organise themselves and register as groups in order to be granted public or council land (role for local GOs and NGOs). Consistent with Dennerly's findings, their article notes that women can use group gardening as forum to recognise strategic gender interests. Also successful projects often stress local materials, crops, methods and sustained technical assistance, inexpensive and accessible inputs. It concludes with a range of possible official actions, from cheap to more costly, to improve the efficiency of communal urban agriculture.

Related to Cockram and Feldman's review, the seventh article of this issue by Davison Gumbo and Takawira Ndiripo examines the recent growth of open-space cultivation in Harare. This is a highly seasonal and mobile form of urban cultivation. Still associated with the shifting nature of most urban agriculture in African urban centres (as opposed to backyard gardening in Latin America and peri-urban market belts in Asia), open-space cultivation in many African urban centres may provide the canvas for a flexible system of more or less temporary communal and market gardens.

As urban centres of post-apartheid Republic of South Africa and other countries look into making more productive use of their public open spaces, Zimbabwe's experience offers a useful reference. Despite historically stringent regulations, open-space cultivation has grown to become a major land-use of metro Harare and few local officials today would discard it as ephemeral. Between 1990 and 1994, cultivated open-space doubled its area, covering nearly 17 percent of metro Harare. Areas close to industrial districts shrank while others close to high-density districts and along roadways and waterways have grown, even in the CBD and on parkland in upscale neighbourhoods north of the CBD (ENDA-Zimbabwe, 1994).

Some planning implications derive from the findings. A really extensive food-growing could be located within walking range of peripheral high-density neighbourhoods where house plots lend little space for growing food; intensive space-confined (soilless, vertical, rooftop) systems could thrive at more central locations. Homeowners were found to be in better tenure position to establish claim on nearby off-plot fields, closeness to permanent residence being important to management and protection. The zoning of some areas for communal gardens or even market gardens would require minimal usufruct guarantees to ensure that producers invest into productive and conservationist practices, including the use of compost-manure instead of or with chemical fertilisers. More productive plots would also mean that these could be

smaller, thus accommodating larger numbers of households than currently.

Intra- and periurban animal husbandry is growing in major urban centres of the region (e.g., Dar es Salaam, Kampala and Bamako) and raises several planning concerns (GRET, 1991; Mougeot, 1994b: 105–115; Centres and Rolland, 1995: 137–148; Metzger, Centres, Thomas and Lambert, 1995 and Shapiro, Ehui and Fitzhugh, 1995). The eighth article of this issue by Ann Water-Bayers explains the pervasiveness and growth of urban animal husbandry: high-valued multiple uses, large variety of species and systems, mobility of animals. Variants of systems are affected by main production aim, scale, intensity, time allocation to activity, dependence on wage labour, genetic stock, husbandry methods, tenure modality. Functions of livestock for different income groups vary but these functions are more numerous and determinant on the poor's livelihood. Micro-enterprises and small-livestock populations are growing despite preferential treatment given to agribusiness operations. Staal and Shapiro's (1994: 533–549) study of urban dairy husbandry in Nairobi illustrates how the traditional and largely unregulated supply structure, referred to by Nasr and Ratta can capture markets, whenever regulatory attempts breed monopolies which raise costs and supply-disruption risks to urban consumers. Urban animal husbandry exchanges resources between urban and rural areas, with cropping systems (manure collection at compost plants and schools for gardeners) and with agribusiness (provides inputs and uses processing wastes).

There are concerns with human health, safety and sanitary risks of urban livestock, still scarcely documented or verified. Less so have these risks been assessed against other factors (including ill-enforced standards in other activities) affecting people's health status, traffic safety or ecological quality; none has been weighed against the benefits to producers and consumers alike.

Still a major information gap persists which could stall the fuller development of animal husbandry's potential in African urban centres. Granted, urban animal husbandry has grown in recent decades despite health and safety concerns; these have regally failed to curtail its expansion as nutrition and income benefits have spoken louder. However, where the activity already exists, every effort should be made to modify or introduce practices which will make urban animal husbandry safer, fairer and more profitable to both producers, consumers and the physical environment.

Waters-Bayer's article concludes with very specific initiatives through which governments can improve their role. The aim is to have more disadvantaged groups increase their access to veterinary services, extension and information on human health risks as well as their capacity to access urban centre resources (via multistakeholder communications and negotiations). It is also for them to defend their interests, to participate in the development of technologies for small-space production (time-saving husbandry for women) and organisational forms for more effective access to inputs, safe waste recycling and open-space management. The author stresses small-scale operations using local and non-conventional feeds, animal species selection accordingly, facility improvement and decentralised farmer markets.

At a micro-zoning level, bylaws must account for household-level integration of different production systems as well as for complementary on- and off-plot farming, typical of African urban agriculture. Closing previous system-specific articles, the ninth article of this issue, by Axel Drescher, examines this complementarity on a household level in low-income high and mid-density squatter quarters of Lusaka. The term 'urban microfarming' refers to crop production, homegardening, horticulture and livestock keeping and is supplemented with wild fruit and vegetable gathering. Noteworthy is that wild food gathering is generally disregarded in urban agriculture literature: 40 percent of Lusaka intra-urban respondents said they practised it. This includes wild-grass cutting, seasonally important to feeding urban cattle as reported on Bamako, Bobo Dioulasso (GRET, 1991 and Centres, 1992) and witnessed in Dar es Salaam. All these activities are different in terms of timing, labour organisation and gender allocation. While in rural areas, gardens and cropfields co-exist separately, in urban centres, dry-season homegardens may convert into wet-season cropfields. Rainfed open-space crops in Lusaka use land fully; cropping patterns and crop choices reduce losses due to theft and drought, pointing to information flows among farmers of different areas of the urban centre. As in Harare, homegardens use animal dung and serve as nurseries for species transferred to ridge-bed fields in the early wet season. Termite-mound gardening in natural wetlands exemplifies site-specific opportunism in the urban environment. Drescher recommends that access to resources be improved as opposed to markets (which don't seem to be a problem) and that preference be given to multistakeholder approaches involving farmers, extensionists, decision-makers and urban planners.

**(d) As Urban Centres Tackle Synergies Between Urban Agriculture and Other Urban Activities, the Former's Role in Urban Resource Recovery Is Drawing Growing Attention in the Region.** Conventional municipal solid and liquid waste management remains administratively highly centralised, capital-intensive and deficit-ridden, with only partial and unreliable truck collection of unsorted materials. An even smaller share of collected loads eventually ends up at few, often remote, sites hazardous to scavengers.

Few urban centres have encouraged at-source sorting and pre-collection of organics by organised groups of urban centre farmers for district-level composting and/or application to intra-urban plots. Few urban centres have made efforts to sell and deliver truckloads to larger clients on the urban fringe. Lewcock (1995: 225–234) found that waste application to peri-urban agriculture has a tradition in Kano and peri-urban farms are a developing market for large quantities of minimally composted waste. This is preferred on rainfed plots and as a complement to artificial fertilisers (crop growth): it enhances long-term soil structure and moisture retention. Peri-urban farmers are willing to pay substantial amounts for acceptable waste and greater collaboration is required between urban waste managers and peri-urban users to fine-tune safety and delivery to their mutual benefit. On the other hand, WASTE's recent survey of urban composting in Africa concludes that neighbourhood-level and micro-entrepreneurial composting has been working effectively in

several urban centres, while most larger plants have failed. Multiplying small-scale projects in any given urban centre will require larger local markets, more transfer sites for pre-collection of solid waste in each neighbourhood, as well as labour-intensive collection systems (Hart and Plummers, 1996).

At-source sorting and doorstep collection are crucial to increasing volumes and improving the safety of organic waste reuse in urban agriculture. This quickens at-source retrieval of organics, lowering health risks to collectors, producers and consumers, including animals. It also reduces the weight and humidity of the remaining solid wasteload, rendering its disposal, incineration or recycling cheaper, safer and more effective. In most African urban centres, solid organics are so valuable to farmers that where at-source collection is not more extensive, this is usually due to major transportation, contractual or regulatory constraints. Where at-source sorting is the exception, collectors of organics prioritise food-processing and retailing businesses where little sorting is needed and usable quantities are large.

Several African urban centres operate municipal wastewater treatment plants coupled with agricultural reuse. Fewer have worked with groups of horticulturists or aquaculturists who reuse the more abundant untreated sewage to come up with affordable schemes for meeting intensive-production needs of those groups.

The tenth article of this issue by Seydou Niang discusses the initial results of an ongoing research at the Cambéréne Experimental Station of the Société nationale d'épuration des eaux du Sénégal (SNEES) in Dakar. An initial phase of this research was supported by IDRC. The situation in Dakar is found in many other sub-Saharan urban centres, where untreated wastewaters are reused directly into horticulture and the produce is sold on local market fairs. In Dakar, drought and soil exhaustion have caused horticultural production to decline; given the growth in volumes of urban wastewaters and their richness in fertilising elements. These are becoming an alternative, sometimes the sole source of water. Public health risks are real for producers themselves and their families in the field, product handlers, consumers and residents near fields. Occurrences of epidemics attributable to mispractice are found around the world. In Niang's view, simple prohibition is not viable and legalisation would allow to better manage and lower its risks. Several actions are in order: pre-reuse treatment of wastewater by extensive and affordable techniques, confine reuse to certain crops less sensitive to disease transmission (fruit trees), modify irrigation techniques (avoid submergence) and limit human exposure through equipment and education.

The study looks at the impact of wastewater irrigation on cultural practices and sanitary quality of produce. It characterises different types of wastewaters used in horticulture and the impact of their use on producer's water needs, crop selection, irrigation modalities, quantities of water and inputs required (parkland manure, peanut milling waste and fish manure). Physical, chemical and biochemical traits of wastewaters make them particularly interesting for horticulture and they are water and input saving. Bacteriologically, faecal coliforms and streptococcus concentrations make them unsuited per WHO standards for

unrestricted gardening. Parasitological analyses of vegetables watered with untreated wastewater showed that produce ready for sale contain eggs and larvae of parasites harmful to humans if consumed raw. Also domestic livestock which are eaten up by residents do drink at untreated wastewater ponds.

Since no single known treatment technology exists for meeting horticulture requirements of safety, productivity and affordability, the Cambéréne Station is developing a sequence of treatment composed of elements from different procedures (manuring under bare ground, microphyte lagooning and Pistia floating mats) in order to optimise a good purification, disinfection according to WHO norms, moderate reduction of azote and phosphorus, balance of azote and phosphorus, as well as sufficient production of water.

The public and environmental health risks posed by urban agriculture are a major concern among policy-makers throughout Africa. This concern is often an argument for trying to write off open-space cultivation, even backyard gardening in some urban centres. Much of those risks may stem from improper handling of agrochemicals by producers, application of unsorted or insufficiently treated solid and liquid organic wastes to specific crops and crop selection/location without due regard to site exposure to ambient air and soil pollution. Still under-researched, this concern is likely to grow as more urban centres try to reuse as much solid and liquid waste as possible to curb pollution and optimise freshwater resource use. In Harare where this is definitely an issue (Gumbo and Ndiripo, this volume), preliminary findings from Bowyer-Bower and Tengbeh's research (1995) show that open-space cultivation contributes more to land degradation than to pollution itself. Chemical pollution effects of industrial effluents and discharges, illegal dumping, housing sewage, and surface water are far more serious on surface water than the worst possible polluting effects of chemicals used in urban agriculture. Agrochemicals are expensive locally and their use is still very limited: potential pollution from that source will remain low in the near future. On the other hand, open-space cultivation has reduced rainwater infiltration into the soil, particularly in long-cropped sandy granite soils. It has multiplied, thanks to a crusting effect, surface runoff manyfold; rainsplash and runoff have increased enormously sediment movements, soil erosion and siltation (steep-slope open-space cultivation). However, cultivation techniques influence considerably soil erosion and the majority of plots have acceptable levels of loss. Ridges and furrows could bring erosion rates within tolerable levels elsewhere.

Initial evidence in Harare points to a need for both technical (proper siting, recourse to agroforestry) and policy (land tenure/usufruct security) interventions, in order for open-space cultivation to become more productive and profitable, and to reduce erosion and siltation and expand the tree cover in urban centres.

**(e) More Urban Centres are Resorting to Multistakeholder Consultations to Set Action Courses Regarding Urban Agriculture Policy, Planning and Management Issues Discussed in Items (b), (c) and (d) of the Introduction.** The City of Dar es Salaam has gone from early inclusion of urban agriculture in its 1968 master plan

to running a multistakeholder exercise to enhance synergies between urban agriculture and other urban sectors for the management of future growth (Dar es Salaam City Council and Centre for Housing Studies, 1992 and Sawio, 1994). Several public consultations on urban agriculture have taken place or will be held in the region in the near future: Kampala (1993), Dar es Salaam (1993–today), Harare (1994), Pretoria (1994), Ouagadougou (1995) and Accra (1996). A multistakeholder conference organised by the Pretoria Technikon in February of 1994 and attended by 400 people had most papers assessing the potential of urban agriculture as a major productive use of public space in post-apartheid urban centres of the Republic of South Africa. As most consultations are recent and follow-ups to these even more so, little is known yet of their practical outcomes. No doubt that part of the future research agenda in Africa will be to monitor, evaluate, disseminate and improve the effectiveness of such exercises.

Symptomatic of this trend, several articles in this issue stress the need for research to be more participatory and produce information on key local roadblocks for issues prioritised through multistakeholder consultations.

The eleventh article of this issue by Julie van der Blik and Ann Waters-Bayer submits a framework and a checklist which can be useful to urban centre groups who need to tackle specific constraints or exploit opportunities in urban agriculture. The sequence includes (a) urban centre-level preliminary context analysis and assessment with the producers themselves; (b) participatory urban appraisal with neighbourhoods typical of the range of intra-urban diversity (techniques recommended and some exemplified); (c) recognition of urban agriculture functions and resources, including multistakeholder prioritisation of issues to guide specific interventions; (d) stakeholder workshop to discuss results of previous steps and facilitate equal-footing negotiations and coalitions for interventions; and (e) participatory monitoring and evaluation for accountability, adjustments and dissemination. Participatory issue-definition and action-taking are very important for all parties to benefit from the state of affairs targeted by the exercise. Policies which would enhance exclusively the role of small-scale urban agricultors in urban food supply strategies could be opposed by powerful groups (May, 1994). Conversely, consultations dominated by the latter will lack credibility among the former and do little to improve their lot.

Kampala is one capital city where research has increasingly shifted from generating baseline data to informing public debates and assisting policy-making on urban agriculture. The twelfth and closing article of this issue by Gertrude Atukunda and Daniel Maxwell summarises various studies conducted at the Makerere Institute of Social Research with IDRC and Fulbright funding. This is the first known research to systematically and statistically examine in a major African urban centre, the impact of urban agriculture on the nutritional health of children in households of various income groups. An early version of this article informed a public debate in Kampala in late 1993, installed by the Mayor himself. Findings were used in reports produced under the World Bank-funded First Urban Project (Uganda), which ended up recommending the inclusion of agriculture

as a legitimate land-use in the master plans of Jinja and Kampala. The recently adopted long-term plan for Jinja promotes some land use for agriculture; since late 1994, new land-use regulations adopted by the Kampala City Council now explicitly permit "homebased agriculture, including the growing of crops and keeping of livestock".

Fundamental to a favourable shift in officials' attitudes observed by Atukunda and Maxwell during the 1988–1993 period was the active local-level militancy of urban farmers and political support by elected district councillors (also in Harare in the early 1980s, Mbiba, 1994: 196–197). In this now more receptive environment, the authors stress the need to still convert urban planning from a technical into a broadly-based political process to formulate and enforce bylaws which can manage a real urban centre, changing bylaws from ineffective banning paper tigers into instruments for correcting detrimental aspects of informal practices. Some policy reforms could threaten access to land by informal urban agriculture and such risk should be curbed through appropriate zoning, compensation and reallocation of evicted activities. The article presents various methods through which a dialogue can be furthered among urban farmers, researchers and policy-makers.

### **The International Context: Local Authorities and External Support Agencies**

As Africa becomes urbanised, urban councils of large urban centres participate more actively in international congresses and are more listened to. Recent fora have been paying much greater attention to the role of urban agriculture in urban development than a decade ago. For instance, the International Union of Local Authorities had panels addressing urban farming at its 31st World Congress in Toronto in June 1993. One year later, the Global Forum on Cities and Sustainable Development convened 50 city delegations from the North and the South in Manchester, providing them with an Advisory Workshop on Urban Agriculture.

The Global Forum's Advisory Workshop on Urban Agriculture was attended by members of at least half of the city delegations. These were surveyed at the Workshop. Almost all respondents said there was agriculture both within and at the edge of their home city. A little more than two-thirds said it was done by households, with a third adding that entrepreneurs and institutions were also engaged. Only a quarter said urban agriculture was causing some problems but two-thirds said their city was benefitting generally from it. A third said city farming was regulated somehow in their city, with only a quarter knowing of any support programmes or research underway on agriculture in their city.

In August 1994 in a Declaration on Social Development and Sustainable Human Settlements issued at the International Colloquium of Mayors on Social Development at the UN in New York, over 100 mayors from around the world invited various sectors of society to join them in six categories of actions for the sustainable development of their cities. The top category read as follows: "Reducing urban poverty by providing productive employment for the poor and the jobless in the private and public sectors, promoting urban agriculture and supporting micro-enterprise development through credit

and training, particularly the informal sector” (International Colloquium of Mayors on Social Development, 1994: 10).

The change of attitudes among local and national governments in Africa is influencing a corresponding change among the international development community and vice-versa. Even with the divorce between agriculture and the urban centre still not fully resolved, urban agriculture is mobilising a growing number and very diverse set of agencies.

In the wake of the Brundtland Report in 1987, the United Nations University’s Food-Energy Nexus Program, the Man and Biosphere Project and IDRC-sponsored surveys in African urban centres, UNDP informally convened a Support Group on Urban Agriculture (SGUA) in mid 1992. Two years later, institutional representation at the SGUA’s Third Meeting in Ottawa had tripled to 18 institutions of which six are support agencies. When the SGUA met at IDRC in March 1996, it agreed on creating a global support facility, defined workplan priorities and took charge of specific tasks to improve information and coordination among agencies for communications, research, policy, technical assistance and credit and investment in urban agriculture (the reader can correspond with the SGUA on Internet through addressing his message to SGUAF-CL@internet.idrc.ca). Several agencies now recognise openly past project support to urban agriculture. Some are creating inter-sectoral working groups, exploring ways to incorporate urban agriculture concerns in current structures and programmes, when not formalising new programme mechanisms. More are also collaborating one with another on specific projects and are reviewing the industry in their annual corporate reports.

The following is an incomplete landscape of international activity in urban agriculture, yet it sets a relevant context for future local initiatives in Africa. UNDP recently published TUAN’s study on urban agriculture; it is assisting Southern local governments with their learning more about each other on how urban agriculture can render the development of their urban centres more sustainable. At the time of this writing, several consultations were being planned to ensure that synergies between urban agriculture and other sectors of urban development are taken into account in proposals, agreements and follow-up to Habitat II in June 1996. IDRC is working with several multi- and bilateral agencies to support production technology improvements and concerted policy interventions in Africa, safe community-based liquid and solid waste reuse for urban agriculture in Asian urban centres and regional networking in Latin America. CIDA, with the Canadian Urban Institute and GTZ have been supporting urban agriculture as a productive use of green belts around major urban centres (La Havana, Cuba and Maputo, Mozambique). SWEDEPLAN has assisted local governments in Lesotho and Botswana with incorporating intra-urban food production into social housing planning (Greenhow, 1994). Dutch Development Cooperation is promoting urban agriculture as part of its policy on urban poverty alleviation (Kolstee, Bijlmer and van Oosterhout, 1994: 72, 148); it is supporting peri-urban zoning for high-density residential use with open-space food production in African urban centres (Joep Bijlmer, personal communication, March 1996). GTZ is assisting the development of periurban horticultural system in Dar es

Salaam (Richter, Schnitzler and Gura, 1995: 135–140). DANIDA has been channelling funds through regional banks to assist cooperatives of female urban farmers in East Africa (Mougeot, 1994b: 115). FAO is leading technical assistance and training as well as feasibility studies for a whole range of intra and peri-urban production systems (hydroponics, horticulture, animal husbandry and forestry) (Marulanda and Izquierdo, 1993; Kuchelmeister and Braatz, 1993: 3–12 and Phelan and Henriksen, 1995: 27–34). UNCHS has been co-supporting multistakeholder consultations for urban management action plans which account for urban agriculture (IDRC files). UNICEF, CARE and OXFAM have been exploring the potential of urban agriculture within more comprehensive food security strategies (UNICEF, 1994 and IDRC files).

The World Bank has been supporting the treatment and reuse of liquid and solid waste from cities into urban and rural agriculture (Khouri, Kalbermatten and Bartone, 1994). It recently supported projects recommending inclusion of agriculture as a legitimate land-use in new master plans (Atukunda and Maxwell, this volume).

The Bank also commissioned an assessment for more comprehensive Bank support to urban agricultural activities in sub-Saharan urban centres (Smit, Ratta and Bernstein, 1996a). The report finds evidence of extensive urban farming occupying increasing amounts of land and producing benefits in terms of food and fuel production, waste and natural resource management in sub-Saharan urban centres. It identifies as common constraints inadequate institutional/legal frameworks, limited access to agricultural inputs and post-production services, inadequate technical knowledge of urban agricultural practices, organisational constraints, political and sociocultural biases and lack of physical security.

The report concludes from the Bank’s record that it has overlooked urban agriculture and its potential benefits, in both its sector work and lending programme, even where the industry is already substantial. It recommends that the Bank increases its involvement, through approaching urban farming with an interdisciplinary perspective (urban development, urban environment, infrastructure and agriculture), accounting for urban agriculture when formulating larger environmental strategies in urban areas or integrated coastal zone management plans (especially where there is larger potential for intensifying urban agricultural activities), collaborate locally and internationally to increase funding efficiency and to coordinate donor activities and investments, to advise borrowers on how to choose policy instruments suited to remove local constraints and maximise urban farming’s contribution to food security, income generation and natural resource and waste management (i.e. through Regional Municipal Development Program and other developing mechanisms).

A Development Bank of Southern Africa (DBSA) paper on policy support to micro-entrepreneurial development includes urban agriculture and recommends more compact, inward development of urban centres, temporary access to land to poorest producers, reversal of trend towards ever-smaller plots for shelter and review of exclusionary land-use zoning, to facilitate combination of housing with income-generating activities at the household level (Rogerson, 1996:

30, 34). The DBSA has supported several small food-producing projects in urban centres (Rogerson, 1993: 25).

### Conclusion

This issue of the *African Urban Quarterly* is the more recent in a sequence (Hunger Notes 1992, IDRC Reports 1993, Unasyuva 1993, ILEIA 1994, Habitat International 1995, Entwicklung Landlicher raum planned for late 1996 and Environment and Urbanisation planned for 1997) which has been organising and reporting on the growing knowledge and know-how on urban agriculture. This issue, however, is the first of the sequence to focus exclusively on Africa, reason why this Introduction has prioritised Africanist literature. Hopefully, equivalents for other regions of the world will soon be available.

A trend is noticeable across the material published so far on African urban centres. Since Vennetier's 1961 study on Pointe-Noire and throughout the 1970s and most of the 1980s, research tended to be dispersed geographically, single-authored and academic, baseline descriptions, loosely interconnected. As of the late 1980s entries reflect more structured efforts which synthesise and build on previous research. More address specific issues and prescribe practical interventions.

For this issue, no specific terms of reference were given to the authors as papers could not be commissioned as consultancies. However, the authors were chosen based on their known research interests. This enabled us to order their contributions under the trends which have been introduced herein. A special effort was made to secure the participation of young researchers from different countries, with studies using a wide range of methodologies (from regional overviews to individual life stories). Even so, the issue is biased towards anglophone sub-Saharan Africa, social science approaches and policy concerns. References to other African sub-regions, other disciplinary perspectives and technological aspects of urban agriculture will be found in the bibliographies of the articles.

Collectively, the articles do not claim urban agriculture to be either a panacea to African urban centres' problems (food security, employment and open space and waste management) or the mother of all urban epidemics. Nor do they pretend that urban agriculture should ever make urban centres food self-sufficient, independent from rural food supplies. However, they argue with sound evidence that food self-reliance is and will remain central to the urban poor's food provisioning strategies. Urban agriculture may more often than not be well positioned to supply cheap, fresh and reliable sources of micronutrients well into the next century. The articles and their references also present some evidence on spin-off effects of urban agriculture in the larger urban economy. Future research systematically documenting such linkages should further steer urban agriculture clear from the 'black hole' stigma often affixed to it. The articles are particularly concerned with the significance of urban agriculture for the urban poor, surveys also clearly show that higher income groups compete with the poor for resources; without proper and timely public intervention, urban agriculture could become a battlefield for the survival of the urban poor.

An overarching message of this issue is that urban agriculture should not be promoted and managed as an end *per se*. Rather it must be integrated into cross-sectoral and multistakeholder strategies for mutually beneficial urban and agricultural development. Greater collaboration between research and development capacities in urban planning and those in agricultural development is urgently needed to make urban farming more effective and sustainable in African urban centres of the 21st century. On one hand urban-based experimental research in agriculture has stressed land-extensive monocultural systems under secure tenure, with high capital and input needs. On the other, urban surveys reveal widespread, space-confined, labour-intensive, integrated, waste-reusing, partly local market-oriented, food-producing systems operating despite precarious tenure. Little research and development investment could be found in the region that would bridge the void, by either adapting the rural experimental and/or improving the urban empirical so as to turn into opportunities major constraints faced by most low-income urban farmers (e.g., lack of on-plot ground-level space, insufficient and unsafe air, soil and water inputs). Advances underway in Latin America and Asia in popular hydroponics, stall-fed animal husbandry and small-scaled integrated farming offer much potential for exchange and mutual learning.

### References

- Adams, R.M. (1994). "The Origin of Cities", *Scientific American* (special issue).
- Archibald, P.V. (1993). *City of Toronto Support for Urban Food Production: Creating a Garden City*. Proposal from the City of Toronto Interdepartmental Technical Working Group on Urban Food Production, revised 9 Nov 1993. City Hall, Toronto.
- Atkinson, S.J. (1995). "Approaches and Actors in Urban Food Security in Developing Countries", *Habitat International* Vol. 19 No. 2: 151-164.
- Bowyer-Bower, T.A.S. and G. Tengbeh (1995). *The Environmental Implications of (Illegal) Urban Agriculture in Harare, Zimbabwe*. Working Paper No. 4 of ODA Research project R5946. Presented to the "Workshop on the Environmental, Social and Economic Impacts of (Illegal) Urban Agriculture" in Harare, Zimbabwe, University of Zimbabwe, Harare.
- Butland, C.A. (1976). *People of the Sun: The Civilizations of Pre-Columbian America*. New York: Praeger.
- Centres, J.M. and J.P. Rolland (1995). "Adaptation of Red Meat and Milk Commodity Systems to An Adverse Macroscenario: The West African Case", in R. Trevor Wilson (ed) *Supply of Livestock Products to Rapidly Expanding Urban Populations*. Proceedings of Joint FAO/WAAP/KSAS Symposium at Seoul National University. Rome: Food and Agriculture Organisation.

- Centres, J.-M. (1992). *Agriculture et élevage urbains et péri-urbains à Bobo Dioulasso: Les filières d'approvisionnement en intrants et de commercialisation des produits agricoles*. Paris: GRET. Département de Géographie, Université de Ouagadougou, INERA, Bobo Dioulasso.
- Coe, M. et al. (1986) *An Atlas of Ancient America*. Oxford: Equinox.
- Cosgrove, S. (1994). *Une histoire des deux villes: Canadian Community Gardening in Montreal and Toronto*. Ottawa: Cities Feeding People Series Report 8. International Development Research Centre.
- Courtlandt, C. and A. Kocybala (1990). *A Guide to the Archaeological Sites of Israel, Egypt and North Africa*. New York: Facts on File.
- Dar es Salaam City Council/Centre for Housing Studies (1992). *Environmental Profile of the Metropolitan Area*. Dar es Salaam: DSM and ARDHI.
- Della, A.A. (1991). *Dynamique de l'espace péri-urbain de Daloa: Etude géographique*. Abidjan, Ivory Coast: Doctoral thesis. Institut de géographie tropicale, Faculté des lettres, arts et sciences humaines, Université nationale de Côte d'Ivoire.
- Diallo, S. (1993). *Urban Agriculture Research in West Africa: Record, Capacities and Opportunities*. Ottawa: Cities Feeding People Series Report 5. International Development Research Centre.
- Diallo, S. and Y. Coulibaly (1987). *Les déchets urbains en milieu démuni à Bamako*. Tokyo: The Food Energy Nexus Programme, United Nations University.
- Drakakis-Smith, D. (1990). "Food for Thought or Thought about Food: Urban Food Distribution Systems in the Third World", in R.S. Potter and A.T. Salam (eds) *Cities and Development in the Third World*. London: Mansell Publishing.
- Drakakis-Smith, D.W. (1992). "Strategies for Meeting Basic Food Needs in Harare", in J. Baker and P.O. Pederson (eds) *The Rural-Urban Interface in Africa*. Uppsala: Nordiska Afrikainstitutet.
- Drakakis-Smith, D. (1995). *Socioeconomic Aspects of Urban Agriculture in Harare: A Preliminary Report of Field Research in 1994/5*. Paper presented at the Workshop on Urban Agriculture, University of Zimbabwe, August 1995.
- Drakakis-Smith, D. et al. (1995). "Urban Poverty and Urban Agriculture: An Overview of the Linkages in Harare", *Habitat International* Vol. 19 No. 2.
- Edwards, P. and R.S.V. Pullin (1990). *Wastewater-Fed Aquaculture*. Proceedings of the International Seminar on Wastewater Reclamation and Reuse for Aquaculture, Calcutta, India, December 1988. Bangkok: UNDP/WB/ESCAP/Government of India. Asian Institute of Technology.
- Egziabher, A.G. (1994). "Urban Farming, Cooperatives, and the Urban Poor", in A.G. Egziabher et al. (eds) *Cities Feeding People: An Examination of Urban Agriculture in East Africa*. Ottawa: International Development Research Centre.
- ENDA-Zimbabwe (1994). *Urban Agriculture in Harare*. Draft Final Technical Report, Environment & Development Activities, ENDA-Zimbabwe.
- ENDA-Zimbabwe (1996). *Urban Agriculture in Zimbabwe: Realities and Prospects*. Proceedings of a workshop organised by ETC International and ENDA-Zimbabwe. Harare: ENDA-Zimbabwe.
- Freeman, D. (1991). *A City of Farmers: Informal Urban Agriculture in the Open Spaces of Nairobi, Kenya*. Montreal: McGill-Queen's University Press.
- Ganapathy, R.S. (1983). *Development of Urban Agriculture in India: Public Policy Options*. Paper presented at the Urban Agriculture Seminar, Singapore, July.
- Girardet, H. (1992). *The Gaia Atlas of Cities: New Directions for Sustainable Urban Living*. New York: Anchor Books Doubleday.
- Groupe de Recherches et d'Echanges Technologiques (1991). *Améliorer l'approvisionnement de Bamako en produits maraîchers et protéines animales. 1—Agriculture et Elevage à Bamako*. Paris: GRET.
- Greenhow, T. (1994). *Urban Agriculture: Can Planners Make a Difference?* Ottawa: Cities Feeding People Series Report 12. International Development Research Centre.
- Guidoni, E. (1981). *La ville européenne: Formation et signification du quatrième au onzième siècle*. Bruxelles: Pierre Mardaga éditeur.
- Hammond, N. (1994). "The Emergence of Maya Civilisation", *Scientific American (special issue)*.
- Hart, D. and J. Pluimers (1996). *Wasted Agriculture: The Use of Compost in Urban Agriculture*. Netherlands: Urban Waste Expertise Programme Working Document 1. UWEP, Goudsa.
- Helmre, K. and A. Ratta (1995). "The Surprising Yields of Urban Agriculture", *Choices* Vol. 4 No. 1.
- International Colloquium of Mayors on Social Development (1994). *Mayors' Declaration on Social Development and Sustainable Human Settlements*. New York, August 1994.
- ILEIA (1994). "Farming at Close Quarters", *ILEIA Newsletter* Vol. 10 No. 4.

- Khoury, N. et al. (1994). *Reuse of Wastewater in Agriculture: A Guide for Planners*. Washington, DC: Water and Sanitation Report 6. UNDP-World Bank Water and Sanitation Program, The World Bank.
- Kironde, M. L. (1992). "Received Concepts and Theories in African Urbanisation and Management Strategies: The Struggle Continues", *Urban Studies* Vol. 29 No. 8.
- Kolstee, T. et al. (eds) (1994). "Urban Poverty Alleviation". The Hague: Sectoral Policy Document of Development Cooperation 5. Ministry of Foreign Affairs.
- Kuchelmeister, G. and S. Braatz (1993). "Urban Forestry Revisited", *Unasylva* Vol. 44 No. 173.
- Jellicoe, G. (1989). *The Landscape of Civilisation*. Northiam, UK: Garden Art Press.
- Lado, C. (1990). "Informal Urban Agriculture in Nairobi, Kenya", *Land Use Policy* Vol. 7 No. 3: 257-266.
- Lamba, D. (1994). "Nairobi Action Plan: City Environment and Sustainable Development" (unedited version of section on environment), in James G. Karuga (ed.) *Action Towards a Better Nairobi: Report and Recommendations of the Nairobi City Convention*. Nairobi: Friedrich Naumann Foundation.
- Lee-Smith, D. and P. A. Memon (1994). "Urban Agriculture in Kenya", in A.G. Egziabher et al. (eds) *Cities Feeding People: An Examination of Urban Agriculture in East Africa*. Ottawa: International Development Research Centre.
- Le Goff, J. (1984). *La civilisation de l'Occident médiéval*. Paris: Arthaud.
- Lewcock, C. (1995). "Farmer Use of Urban Waste in Kano", *Habitat International* Vol. 19 No. 2.
- Lourenço-Lindell, I. (1995). "The Informal Food Economy in a Peripheral Urban District: The Case of Bandim District, Bissau", *Habitat International* Vol. 19 No. 2.
- Marulanda, C. and J. Izquierdo (1993). *Technical Manual on Popular Hydroponics Gardens: Audio Visual Course*. Santiago: Food and Agriculture Organisation.
- Maxwell, D.G. (1994). "The Household Logic of Urban Farming in Kampala", in A.G. Egziabher et al. (eds) *Cities Feeding People: An Examination of Urban Agriculture in East Africa*. Ottawa: International Development Research Centre.
- May, J. (1994). *Development Policy Options for Urban Agriculture in South Africa*. Presented to "Urban Open Spaces: Potential for Productive Utilisation", Conference, Technikon Pretoria, 24-25 February.
- May, J. and C. Rogerson (1994). "How Green is your Garden?" *Indicator SA* Vol. 11 No. 3.
- May, J. and C.M. Rogerson (1995). "Poverty and Sustainable Cities in South Africa: The Role of Urban Cultivation", *Habitat International* Vol. 19 No. 2.
- Mbiba, B. (1994). "Institutional Response to Uncontrolled Urban Cultivation in Harare: Prohibitive or Accommodative?", *Environment and Urbanization* Vol. 6 No. 1.
- Mbiba, B. (1995). *Urban Agriculture in Zimbabwe*. Avebury: Aldershot.
- McCann, A.M. (1994). "The Roman Port of Cosa", *Scientific American (special issue)*.
- Metzger, R. et al. (1995). *L'approvisionnement des villes africaines en lait et produits laitiers*. Rome: Etude FAO Production et Santé Animales 124. Food and Agriculture Organisation.
- Mitlin, D. and D. Satterthwaite (1994). *Cities and Sustainable Development*. London: Background paper prepared for Global Forum '94. IIED Human Settlements Programme, 62 pp.
- Mlozi, M.R.S. (1993). "Inequitable Agricultural Extension Services in the Urban Context: The Case of Tanzania", in N.P. Stromquist (ed.) *Education in Urban Areas: Cross National Dimensions*. London: Praeger.
- Mvena, Z. S. K. (1986). *Urban Agriculture in Tanzania: A Research Proposal*. Ottawa: IDRC.
- Moscoso, J. (1995). *El uso de efluentes de lagunas de estabilizacion en acuicultura y agricultura*. Paper delivered at Latin American Seminar on Urban Agriculture (IDRC/FAO/AIPE), La Paz, April.
- Mougeot, L. (1993). "Farming on Dakar's Edge", *IDRC Reports* Vol. 21 No. 3 (October).
- Mougeot, L. (1994a). *Urban Food Production: Evolution, Official Support and Significance*. Ottawa: Cities Feeding People Series Report 8. International Development Research Centre.
- Mougeot, L.J.A. (1994b). "Leading Urban Agriculture into the 21st Century: Renewed Institutional Interest", in A.G. Egziabher et al. (eds) *Cities Feeding People: An Examination of Urban Agriculture in East Africa*. Ottawa: International Development Research Centre.
- Mvena, Z.S.K. et al. (1991). *Urban Agriculture in Tanzania: A Study of Six Towns*. Draft report. Department of Agricultural Education and Extension, Sokoine University of Agriculture, Morogoro, Tanzania.
- National Environmental Information Centre (1994). *District Environment Profile: Kampala*. Kampala: NEIC.

- Pain, M. (1985). "Kinshasa: Symbole d'une Afrique urbaine", *Cahiers d'Outre-Mer* Vol. 38 No. 149.
- Phelan, J.A. and J. Henriksen (1995). "Global Issues in the Supply of Livestock Food Products to Urban Populations", in R. Trevor Wilson (ed.) *Supply of Livestock Products to Rapidly Expanding Urban Populations*. Proceedings of Joint FAO/WAAP/KSAS Symposium at Seoul National University. Rome: Food and Agriculture Organisation.
- Redclift, M. (1987). *Sustainable Development: Exploring the Contradictions*. London: Routledge.
- Richter, J. et al. (eds) (1995). *Vegetable Production in Periurban Areas in the Tropics and Subtropics—Food, Income and Quality of Life*. Feldafing, Germany: Deutsche Stiftung für internationale Entwicklung Zentralstelle für Ernährung und Landwirtschaft.
- Roberts, D. (1996). "A Greener Vision for the Durban Metropolitan Area with D'MOSS", *Muniviro* Vol. 13 No. 2 (May).
- Rodenbeck, M. (1991). *Egypt from the Air*. Thames and Hudson: Editions Didier Millet.
- Rogerson, C.M. (undated). *Urban Reconstruction and Urban Cultivation in South Africa*. Johannesburg: Department of Geography & Environmental Studies, University of Witwatersrand, unpublished report.
- Rogerson, C.M. (1992). "Feeding Africa's Cities: The Role and Potential for Urban Agriculture", *Africa Insight* Vol. 22 No. 4.
- Rogerson, C.M. (1993). "Urban Agriculture in South Africa: Scope, Issues and Potential", *GeoJournal* Vol. 30 No. 1.
- Rogerson, C.M. (1996). *Rethinking the Informal Economy of South Africa*. Johannesburg: Development Bank of Southern Africa Development Paper 84.
- Sanyal, B. (1986). *Urban Cultivation in East Africa*. Tokyo: The Food Energy Nexus Programme, United Nations University.
- Sawio, C. (1994). *Urban Agriculture and the Sustainable Dar es Salaam Project, Tanzania*. Ottawa: Cities Feeding People Series Report 10. International Development Research Centre.
- Sawio, C. (1993). "Feeding the Urban Masses: Towards an Understanding of the Dynamics of Urban Agriculture and Land-Use Change in Dar es Salaam, Tanzania". Worcester: unpublished PhD Thesis, Graduate School of Geography, Clark University.
- Schilter, C. (1991). *L'agriculture urbaine à Lomé: Approches agronomique et socioéconomiques*. Paris, France: Karthala.
- Shapiro, B.I. et al. (1995). "An Analysis of Constraints and Opportunities in Periurban Dairy Development in Sub-Saharan Africa", in R. Trevor Wilson (ed.) *Supply of Livestock Products to Rapidly Expanding Urban Populations*. Proceedings of FAO/WAAP/KSAS Symposium at Seoul National University. Rome: Food and Agriculture Organisation.
- Smit, J. (1980). "Urban and Metropolitan Agricultural Prospects", *Habitat International* Vol. 5 Nos 3–4.
- Smit, J. et al. (1996a). *Urban Agriculture: An Opportunity for Environmentally Sustainable Development in Sub-Saharan Africa*. Washington DC: Urban.
- Smit, J. et al. (1996b). *Urban Agriculture: Food, Jobs and Sustainable Cities*. New York: United Nations Development Programme Publication Series for *Habitat II* Volume One.
- Staal, S.J. and B.I. Shapiro (1994). The Effects of Recent Price Liberalization on Kenyan Peri-Urban Dairy: A Case Study Using the Policy Analysis Matrix, *Food Policy* Vol. 19 No. 6.
- Thang, V.Q. (1996). *Effects of Sewage Utilisation on Fish Farming and Irrigation (Vietnam)*. Hanoi, Vietnam: Progress report. Vietnam National University.
- Tricaud, P.-M. (1987). *Urban Agriculture in Ibadan and Freetown*. Tokyo: The Food Energy Nexus Programme, United Nations University.
- United Nations Children's Fund (1994). *The Urban Poor and Household Food Security: Concepts, Evidence and Case Studies*. New York: Urban Examples No. 19. UNICEF.
- Vennetier, P. (1961). "La vie agricole urbaine à Pointe Noire", *Cahiers d'Outre-Mer* Vol. 14 No. 53.
- von Braun, J. et al. (1993). *Urban Food Insecurity and Malnutrition in Developing Countries: Trends, Policies and Research Implications*. Washington, DC: International Food Policy Research Institute.
- Wade, I. (1987). *Food Self-Reliance in Third World Cities*. Tokyo: The Food Energy Nexus Programme, United Nations University.
- Warren, P.M. (1994). "Minoan Palaces", *Scientific American (special issue)*.
- Watts, D.J. and C.M. Watts (1994). "A Roman Apartment Complex", *Scientific American (special issue)*.
- Winters, C. (1983). "The Classification of Traditional African Cities", *Journal of Urban History* Vol. 10 No. 1 (November).
- Yanin, V.L. (1994). "The Archaeology of Novgorod", *Scientific American (special issue)*.

# Sociology of Education Abstracts

**EDITOR**

**Dr Chris Shilling**, *University of Portsmouth, UK*

**ASSISTANT EDITOR**

**Karen Woodley**, *Carfax Information Systems, UK*

Supported by an International Editorial Board

*Sociology of Education Abstracts* is an essential resource for academics involved in the research and teaching of education throughout the world. The service draws on a wide range of international sources as a means of serving the information needs of those concerned with the sociological study of education, and provides comprehensive coverage of over 600 journal articles and books each year, in four quarterly issues. Abstracts are prepared by an international team of subject specialists and are non-evaluative in form. Coverage of the service is broad to incorporate the diverse types of material that are relevant to study in this area. Journals from throughout the world and a comprehensive list of publishers catalogues are scanned regularly for appropriate items.

Each year *Sociology of Education Abstracts* provides a complete guide to the most important theoretical, methodological and policy developments relevant to the sociological study of education.

**SUBSCRIPTION RATES**

1998 - Volume 34 (4 issues). ISSN 0038-0415.

Institutional rate: EU £354.00; Outside EU £354.00; North America US\$634.00

Personal rate: EU £138.00; Outside EU £158.00; North America US\$248.00

**ORDER FORM**

Please send a completed copy of this form, with the appropriate payment, to the address below.

Name .....

Address .....

.....

.....



Visit the Carfax Home Page at  
<http://www.carfax.co.uk>

UK Tel: +44 (0)1235 401000  
UK Fax: +44 (0)1235 401550  
E-mail: [sales@carfax.co.uk](mailto:sales@carfax.co.uk)

Carfax Publishing Limited, PO Box 25, Abingdon, Oxfordshire OX14 3UE, UK

## URBAN AGRICULTURE AND THE AFRICAN URBAN FOOD SUPPLY SYSTEM

**Annu Ratta and Joe Nasr**

The Urban Agriculture Network, 1711 Lamont Street, NW, Washington, DC 20010 USA  
Phone: (1-202) 483-8130; Fax: (1-202) 986-6732 and E-mail: 72144.3446@compuserve.com

### Abstract

Accepted October, 1995

*This paper examines the role that urban farming plays in the food supply system of African urban centres. After grounding urban agriculture within the dynamic between urbanising trends, a widening 'food gap', and largely unfavourable policies towards it, the interaction between urban food demand and supply is described based on empirical evidence. Urban food production is then analysed according to its two main, interconnected functions: farming for household consumption and farming for the market. The authors call for greater recognition of the nexus between the urban land-use system and the food-supply system.*

### Résumé

*Cet article examine le rôle de l'agriculture urbaine comme un tout, au sein du système d'approvisionnement alimentaire des villes africaines. Dans un premier temps, on situe la production alimentaire urbaine par rapport à la dynamique existant entre l'urbanisation de la production alimentaire urbaine par rapport à la dynamique existant entre l'urbanisation de la population, le déficit alimentaire croissant, et des politiques surtout défavorables à la production urbaine. Ensuite, on décrit l'interaction entre la demande et l'offre d'aliments dans les villes, en s'appuyant sur des données empiriques. Suit une analyse de la production alimentaire urbaine, notamment ses deux principaux débouchés: l'autoconsommation et la mise en marché. Les auteurs réclament une prise en compte plus explicite de l'interrelation qui existe dans les villes entre leur système d'utilisations du sol et leur système d'approvisionnement alimentaire.*

### Introduction

Urbanisation and food shortages are both well-known phenomena in developing countries in general and in Africa in particular, but they are generally perceived as distinct trends. Food production may be the major urban function that is least noticed by urban planners and decision-makers. Simultaneously, agricultural programmes are largely targeted to rural settings. It is necessary for both the urban manager, the minister of agriculture and others in between to recognise the intricate ties between the increase in urban populations, their growing food needs, the changing agricultural production patterns in and around urban centres, and the areal expansion of land and water surfaces used for this production. As Kironde (1992: 1285) stated, "the received concept that agriculture is a rural and poor man's undertaking unsuited to urban areas needs to be revised."

The call for such a new understanding of the contemporary metropolis is not based on intellectual curiosity, but on empirical observation of an evolution in human settlements in developing countries and most noticeably in sub-Saharan Africa, that is already taking place. This evolution lies in a progressively blurred functional differentiation between urban areas and rural areas. Urban areas in developing countries share some of the traits with the rural areas from which their burgeoning populations came. These urban centres have over time established as one of their primary economic functions the core 'rural' use of land: agriculture. This use in fact had long been important in African urban centres.

The aim of this paper is to introduce the place of urban farming within the nexus between the phenomenon of a massive population increase in urban centres and the system that supplies the nutritional requirements of this population. Urban farming in sub-Saharan Africa today is occurring in the context of rapid urbanisation creating an economic and food supply system in which urban farming fits in two ways: market farming is a competitive and significant supply source in the urban food system while subsistence farming is an essential activity providing food security for swelling numbers of urban poor families who do not have stable financial resources to acquire food in the market as well as for growing numbers from higher income groups who are pauperised due to economic hardships.

Other important components of this emerging urban agricultural activity are not dealt with here. For instance, the connections between food production, wastes and resources have already been dealt with in Smit and Nasr (1992: 141–152). A comprehensive global overview is presented in Smit, Nasr and Rassa, (1996). Here, we focus on how urban farming fits in the urban food supply system on the African continent.

### Urban Agriculture and Urban Policy

Recent research in sub-Saharan Africa has established that urban farming is a significant activity in many countries in the region and contributes to the food security of African urban families, especially the poorest ones. African urban centres tend not to be solidly built, leaving many surfaces that are put into cultivation. Such an extensive farming is

*Acknowledgements*—This paper is based partly on research contained in "Urban Agriculture as a Strategy", a report written by TUAN's Jac Smit and Annu Ratta for the AFTES division of the World Bank. Thanks are due to Jac Smit for his essential comments. Jac is the author of all the photographs in this article, taken between 1991 and 1994.

evident when observed from the air as houses can be seen scattered in the midst of greenery (figure 1).

Surveys in different urban centres have found a significant percentage of the urban households to be farming—over a quarter in Ouagadougou, Upper Volta; 35 percent in Yaounde, Cameroon; over a third in Kampala, Uganda; 63 percent in six Kenyan urban centres; and 68 percent in six urban centres surveyed in Tanzania (Lee-Smith, et al. 1987; Mvena, Lupanga and Mlozi, 1991; Manshard, 1992; Maxwell and

**Figure 1, Ibadan, Nigeria.** This aerial view of a mostly residential area near the airport shows that the majority of the land surface is placed in cultivation by the residents



Zziwa, 1992). Guyer (1987) estimated that 10 to 25 percent of urban Africans farm (cited in Lourenço-Lindell, 1994). Bamako, Mali, produces all of its vegetable demand and exports in some seasons (Diallo, 1993). Urban farming in Kampala today satisfies 70 percent of the poultry demand of the city. Moreover, the activity is rapidly expanding. For instance, the number of animals kept in Dar es Salaam, Tanzania grew by 40 percent in two years, from 586 to 818 thousand (City Council Livestock Office, cited in Kironde, 1992).

In many countries, urban farming provides significant employment in the informal sector. The national census of 1980 in Maputo, Mozambique, suggests that one-third of the urban workforce was involved in agriculture (Kolstrup, 1985). Moreover, certain disadvantaged groups find that urban farming offers them special opportunities to provide for themselves and their household. For instance, surveys have found that around two-thirds of urban farmers in Nairobi, Kenya and in Kisangani, Zaire were women (Lee-Smith et al., 1987 and Streiffeler, 1991). The unique opportunities available to low-income groups are discussed later.

A tradition of limited urban farming—market gardens—was promoted during colonial times in some African countries to supply part of the urban centres' food necessities. Some of this has continued as commercial farming in urban centres, with partial support from the authorities. The market gardening includes fruits and vegetables, poultry and meat production and high-value crops. At the same time, small-scale farming by the poor—for subsistence and sale—has proliferated over the past couple of decades due to the

enterprise and the felt need of the farmers, rather than by government design. It is mostly the story of informal development in the face of official disapproval. Urban planning laws and concepts created during colonial times largely view as inappropriate informal food production within the urban centre (as opposed to formal commercial farming at its periphery). These have engendered negative health and land-use regulations on urban agriculture.

In African urban centres, animals, particularly small animals and poultry have a long tradition as an everyday part of family life in village, periodic market centre, trading centre, town, urban centre and city. Poorer farmers commonly follow the practice of keeping a few small animals—rabbits, guinea pigs, pigeons and chickens in the house, for festival occasions or for sale. Half of all urban families in Kenya and 30 percent of the population in Maputo raise livestock (Kolstrup, 1985 and Lee-Smith et al., 1987). Frequently, urban horticulturists are also animal breeders. In Maputo's case, 80 percent of the urban farmers keep some livestock. However, animal husbandry is generally discouraged by government authorities.

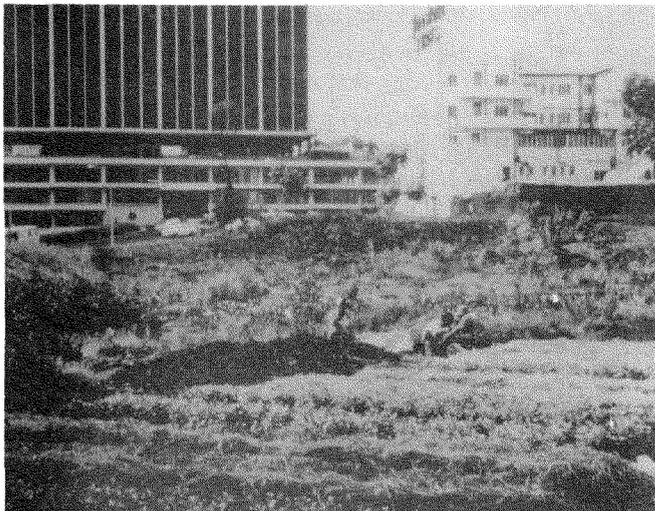
The examples of the struggles of the urban farmer are numerous. In Harare, Zimbabwe, until 1992, the city council periodically ordered the slashing of crops to prevent mosquito breeding and agricultural run-off into the water system (Mbiba, 1994: 188–202). In Bamako, where market gardening on the riverside is supported by the government, the municipality was still cutting down grain ripening on vacant lots in the early 1990s (Kiabou, 1991).

Recently, when faced with a burgeoning agricultural activity combined with an inability to satisfy food demand in urban areas, the attitude of many African governments has evolved from one of slashing crops to one of tacit acceptance, formal approval and even promotion of urban farming. An era of acceptance of urban farming was begun in Zambia in 1977 with a presidential speech urging urban residents to grow their own food. This was followed by a range of actions, ranging from discontinuation of the enforcement of prohibitive laws, to promotional programmes, to the creation of government-run stores (Sanyal, 1985: 15–24). Four main types of agriculture can now be found in Lusaka, Zambia: gardening for family consumption (mostly vegetables), semi-commercial farming, commercial farming and rainy-season agriculture (primarily staples). The first is found within the settled area while the others are more towards the periphery (Drescher, 1994).

In Kenya, the Local Government Act leaves to local authority bylaws to decide whether to permit or restrict urban farming. The Nairobi bylaws prohibit farming along government-maintained streets. Small livestock may be raised freely, but permission is required for keeping large livestock. Small urban centres in Kenya are providing more support. Isiolo, Kenya provides support to urban farmers as well as irrigation water while Kitui, Kenya provides extension (Memon and Lee-Smith, 1993). Despite the constraints it faces, urban farming in fact is thriving in Kenya and elsewhere in Africa (figure 2). What is evident from this and other evidence is that urban agriculture is not a marginal activity

in Africa, but rather a significant sub-sector within both the urban economy and the agriculture industry.

**Figure 2, Nairobi, Kenya. In an open area adjacent to downtown, solid waste is being composted (left and top of photo) and applied in vegetable production**



### Urbanisation and Its Impact on Food and Agriculture

Urbanisation affects the agricultural supply system in many ways. It moves large parts of the national population away from rural farming supply sources. No more is reliance on an entirely local food production possible. Urbanisation creates centres of concentrated food demand that need to be supplied through an increasingly intricate transportation and marketing system. A more formalised food marketing and supply system emerges. It also changes the national demand structure by affecting peoples' diets.

Urban areas of developing countries are growing three times as fast as rural areas, accounting for an estimated 84 percent of the net population increase in those countries between 1990 and 2020. As a result of this trend, the global population will go from 34 percent urban in 1960 to 58 percent in 2020. While North America, Europe and Latin America are already highly urbanised (over 70 percent), it is in the two regions that are at this time the least urbanised that we will see the largest increase in urban populations over the next quarter of a century: Africa (32 percent), followed by Asia (31 percent) (UN-DESIPA, 1993). Consequently, it is in these two continents that the food and agriculture systems will feel the greatest impact of urbanisation. The highest urban growth rates will be in countries that are least equipped to feed their urban centres—the 49 countries classified by the United Nations as Least Developed, which happen to be today among the least urbanised nations.

While most of these countries are located in sub-Saharan Africa, the urbanisation levels are not constant across the continent: about 45 percent in southern Africa, 35 percent in West Africa, 33 percent in Sahelian countries, and only 20 percent in East Africa (UN-DESIPA, 1993). Although these numbers are still low, they have been rising staggeringly fast. After having increased from 32 million in 1950 to 206 million in 1990, Africa's urban population is expected in 2020 to exceed 700 million—equivalent to the current total population of the continent (Virji and Schram, 1994). In this period,

Africa will add a half billion to its urban population. In comparison, North America and Europe together will add 150 million (UN-DESIPA, 1993).

Urbanisation in most developed countries was fuelled by economic development and accompanied by intensification of agriculture and development of a national food distribution system. Some studies have found growth in urbanisation to be related to economic development (von Braun et al., 1993). However, in many developing countries, urban growth is occurring even in the face of low or negative economic growth and weak development of the food transportation and marketing infrastructure. In sub-Saharan Africa, this growth is caused more by rural migration (about 60 percent) than by natural internal increase (UN-DESIPA, 1993). All these factors are creating pressures on the urban food supply, with food production in and around the city becoming increasingly competitive and in some cases essential for survival.

Out-migration from rural areas has multiple impacts on the supply of agricultural labour and skills. It is usually the younger (and better educated) people with higher earning capacity that migrate to urban centres. In parallel, with everything else equal, this particular characteristic of out-migration causes a reduction in the quantity of cash crops produced in rural areas and particularly in the outflow of agricultural products towards the urban centres. Moreover, other factors, such as the AIDS plague, impact the productivity of the rural farmer. Thus, the supplies of food from rural areas suffer doubly from the labour flows and other causes. This outcome is sometimes mitigated by the short distance of the migration or by the maintenance of productive relations with the village of origin. However, migration is often to urban centres that are too distant and, over time, the direct ties of the urban residents with farmland are reduced.

Consequently, agricultural production must increase to feed the growing urban population, whether by having higher yields per worker, by increasing the number of workers, or by tapping additional sources of production such as urban agriculture. According to FAO estimates, about 131 million tons of food in wheat equivalent would be needed to feed the population that is expected to have migrated to urban areas in developing countries between 1980 and 2000, and an additional 160 million tons for the natural urban population increase (UN-FAO, 1984).

A food gap already exists in sub-Saharan Africa between the higher overall rate of population growth and the lower rate of increase in the production of staple cereals. World Bank forecasts indicate that to achieve food security, food production will have to grow at about 4 percent per year, twice the rate of the past 30 years (Virji and Schram, 1994). At the same time, the continent's arable land per capita has been cut in half from 1.2 acres per person in 1965 to 0.6 acres today (UN-FAO, 1993). If relying on an increase in agricultural productivity on rural farms alone, many countries in Africa may not be able to keep up with the food, nutrition and other needs of the increasing urban populations. This may be particularly critical for countries that do not have the foreign exchange to import food. In this context, urban farming is a natural economic response that must not be ignored

### The Urban Food System

In order to understand urban farming, it is necessary to study it as a part of the urban and national food supply and demand system, within the context of the urbanisation process. The urban food system, consists of (a) the food urban residents consume, (b) the places where it is produced and (c) the often complex processes by which it gets from producers to consumers.

Urbanisation's impact on the *food demand* structure in the country is multifaceted. It not only impacts the levels of demand for food, but also the types of food demanded. In general terms, compared to rural populations, urban residents tend to eat more varied food, more animal protein and consume fewer calories. This statement should be tempered by limitations that the poorest citizens face in gaining access to many protein-rich, less affordable products, and in fact may consume more starchy, high-carbohydrate foodstuff. On the other hand, the growth in absolute numbers in middle-income residents associated with urbanisation has resulted in a growth in demand for certain cereals, high-value crops, fruits, vegetables and meat products in many countries.

What is clear is that diet changes (of one type or another) are generally associated with the urbanisation process and these changes have several repercussions. Consumption of traditional basic foods (staples) is often replaced in urban centres by consumption of more processed—and often non-indigenous—foods such as rice and livestock products, along with a higher consumption of pre-cooked and convenience foods. In part due to this trend, the change typically has brought about a higher incidence of cancer and heart disease in urban populations in developing countries.

Urban diets have a significant impact, not only locally but nationally and beyond, on the agricultural demand structure. In Tunisia, for example, per capita consumption of the locally grown durum wheat among residents of small and intermediate urban centres is about half the amount consumed by rural residents while for residents of large urban centres, it is only one-fourth as much (von Braun et al., 1993). Drakakis-Smith (1992: 38–58) reports on urban residents eating four times as much rice and wheat as rural ones in sub-Saharan Africa. The increased consumption of meat products by urban dwellers is supplied through intensive livestock farming, especially in peri-urban areas and creates a sharp increase in demand for feed grains.

From where, then, do people obtain their food? Villages get their *food supply* from farming within the settlement and surrounding countryside. In urbanised areas, however, the immediate surroundings have to adjust their production capacity to keep up with the growing and changing food demand, as nearby farmland is taken over for urban uses. Consequently, farming in the region intensifies and adapts its crops to the new demand and additional food is imported from other parts of the country or from abroad. If the food supply system is viewed as a series of overlays of 'food-sheds' of varying diameter, shape and direction from the urban centre (depending on the type of agricultural product), then the 'food-sheds' expand along with the urban centres they serve.

In more developed countries, urbanisation was tied to the development of a more intricate national marketing and transportation infrastructure that provided the urban centres with food from remote rural and foreign sources. The urban marketing structures moved gradually from the traditional petty trade structure—characteristic of periodic market centres, trading centres, towns, villages and urban centres—to formalised and capitalised market structures along with extensive storage, refrigeration and processing facilities that increase the shelf life of food.

What we have found though is that in Africa the traditional food supply structure is being overlaid with rather than replaced by, this new structure. The remote systems could not single-handedly nourish all urban residents at affordable prices. Remote food production now complements local ways of furnishing residents of urbanised areas with their nutritional needs. The complexity of the urban food system in Africa has, therefore, greatly increased.

Drakakis-Smith (1992) has identified three main components of the food supply system of urban centres: urban residents acquire food through exchange (purchase or barter), production (home production, subsistence farming) or transfer (food aid, donation, food stamps and feeding programmes). The sources of purchased food may be rural producers, urban producers or import.

The amount of food supplied by the various sources—urban, rural and foreign—as well as the crops predominantly supplied by each source vary depending on various factors, including the economic condition of the country; the level of development of the food marketing, storage, and transportation infrastructure and system; agricultural productivity; the geography of the urban region (topography, soil conditions and climate, etc....); the availability of land and water resources; and agricultural and urban development policies.

Wherever the national food marketing and transportation system is not well developed, urban farming is particularly competitive. For high-value, specialty, and especially perishable crops, urban farmers have the advantage of closeness to market. This reduces transportation time and cost, supplies crops that may otherwise not be fresh or even available, as well as provides the means to follow the market closely to respond rapidly to market needs and prices.

Urban farming appears in many parts of the urban food system—it includes a spectrum of farming activities undertaken by a variety of farmers who farm for sale in the market or for home consumption. The commercial farmers range from large enterprises to middle-class family businesses to poor farmers who produce mostly for food security but sell their product whenever they can. Farming for consumption is mostly done by the poor who lack stable income to purchase food. However, much larger sections of the economy are found to grow some of their own food in the hard economic times faced by many countries in the region.

### Urban Farming for Household Consumption

Accompanying the growth of urban centres in Africa is a considerable expansion in the scale of urban poverty. In 1988,

about one-third of the poor in developing countries were living in urban areas. By 2000, the proportion is expected to increase to about 57 percent. In Africa, the corresponding increase is from 23 to 42 percent (Popkin and Bisgrove, 1988: 13–23). The conditions and causes of hunger and malnutrition in urban centres are very different from those in rural areas, requiring very different policy interventions.

The reasons for the African urban residents' undertaking cultivation and animal raising are manifold. By depending on supplies from rural areas and overseas, urban families are often finding difficulty in having access to sufficient food to satisfy everyone's necessities. These shortages are in turn linked to higher food prices. Several surveys have found that poor urban households spend up to 70 percent (occasionally even more) of their income to purchase food (Khourri-Daghar, 1986 and Sanyal, 1986). Amongst the very largest urban centres, for instance, more than half the average household income is spent on food in several cases: 63 percent in Kinshasa, Zaire; 58 percent in Lagos, Nigeria; 55 percent in Algiers, Algeria and 51 percent in Alexandria, Egypt (Ethelston, 1992: 16–17). While these numbers are for the total population, they tend to be even higher for the poorer citizens. Some researchers have found that the urban poor eat poorer diets, often pay higher prices and spend more of their earnings on food, especially due to their low and irregular incomes (Lourenço-Lindell, 1994). This is where urban agriculture enters the picture.

The lower the income group, the greater the percentage of household food consumption that is self-produced, providing over half the total needs in some communities. For Lusaka's poor, self-produced food amounts to one-third of total food consumption, involving an estimated 45 percent of low-income families cultivating either in a home yard or in gardens on the periphery of the urban centre (Sanyal, 1986). Poor families in Addis Ababa and Kampala save 10–20 and 37 percent respectively of their income through home production of food (Mougeot, 1993: 2–5). In Nairobi, where close to two-thirds of urban households grow part of their own food, 77 percent of these urban farmers produce entirely for their own consumption (Lee-Smith et al., 1987).

The 1980s were a time of economic downturn in Africa and urban populations were particularly hard hit by the recession and subsequent structural adjustment. Urban populations are also more vulnerable to breaks in the food supply, through war, civic disturbance, natural disaster or famine; Africa has had more than its share of all these since the 1970s. Consequently, urban poverty has grown faster than rural poverty in many developing countries. Prices of agricultural products were rising while urban incomes were falling. Food subsidies were cut in several sub-Saharan countries. While economies shrank, urban centres continued to grow in size. With fewer opportunities and lower remuneration for employment and much traditional entrepreneurship, countless of the poor along with thousands of higher-income families that were increasingly facing the problem of food insecurity turned to agriculture in sub-Saharan Africa, joining those who had been practising it all along.

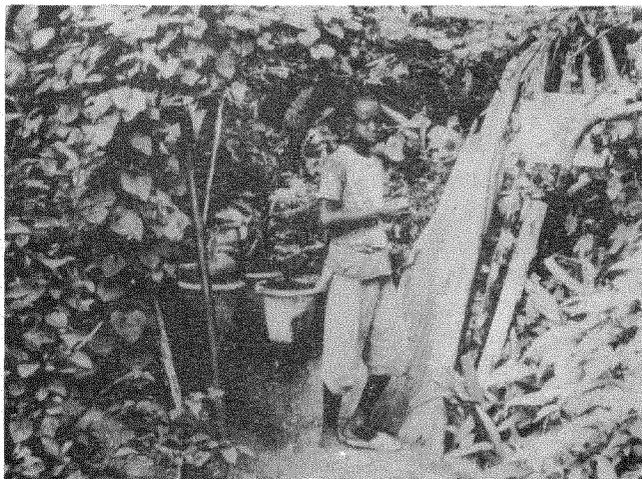
In the late 1960s, a survey found that 18 percent of the families in Dar es Salaam, Tanzania were engaged in agriculture. Another survey in 1991 found the percentage to have increased to 68 percent (Mvena, Lupanga and Mlozi, 1991). This massive shift occurred mainly in the 1980s and included all economic levels and all portions of the city (Sawio, 1993).

Reports from Kinshasa and Maputo suggest that a similar massive shift to agriculture occurred in those two urban centres during the time of instability and economic decline. According to Jamal (1988: 679–701), Kampala, Uganda now produces twice as much of its caloric needs than it did in 1972 (40 percent as compared to 20 percent). In a statistical study in Kampala, Maxwell (1993) found children of low-income farming families to be as healthy as children of high-income families and healthier than children of non-farming poor families.

Urban food supply is particularly insecure in countries with undependable supply sources due to poor infrastructure (e.g., Uganda and Zaire) and countries that suffer disruption of transportation networks and food production due to wars or weak governance such as Angola, Somalia, Mozambique, Sudan, Liberia and Rwanda. During enduring crises, urban agriculture offers means of survival for the urban and refugee populations. It has been found to increase in Kinshasa, Maputo and in Liberian refugee camps (figure 3). Even where crisis does not entail war or national collapse or natural calamity, the occurrence of urban farming increases in countries facing political or economic stress such as has been the case in Tanzania.

Lourenço-Lindell (1994) found structural adjustment to have had a large negative impact (unemployment, devaluated salaries, inflation) on urban residents in Bissau, Guinea Bissau. Among the consequences was a decline in urban nutrition. Such a collapse led to more activity shifting from formal to informal sector. In Bissau, this meant the opening of new food stalls and markets in suburban areas balancing the closing of shops in the core. Extensive rice cultivation, consumed entirely within the extended family, has developed

Figure 3, Abidjan, Côte d'Ivoire. Liberian refugees have taken over an undeveloped industrial site and converted it to vegetable and fruit production for food security and market. The shack on the left is the home of a watchman



on plots in Bandim, the largest unplanned settlement in the urban centre of Bissau. Also found were some backyard gardens, mostly for vegetables. All this activity is labour intensive, with a minimum of purchased inputs.

Atkinson (1992) saw one factor that makes the promotion of urban farming superior to other food aid policies: it generates less dependence by the recipient of the assistance. Where it thrives, there can in fact be less need for assistance from outside. This was demonstrated in 1981 in Kampala, Uganda where, despite intense economic problems, UNICEF concluded that supplementary feeding aid could be discontinued due to families producing part of their own food within the city (Mougeot, 1993: 2–5). In another instance, Mozambique was facing in 1985 severe malnutrition after three years of drought in the country. Import, food aid and state farms were not sufficient to supply Maputo, but the green belts in and around the city proved to be a significant source of food which could be even more productive given proper support. The Zonas Verdes programme was, therefore, established, covering 16 percent of the city area with overwhelmingly female practitioners (Kolstrup, 1985).

Urban agriculture by the poor (as well as by the middle-income) urbanite implies failure of the urban and national political and economic systems to deal with poverty and provide food security, whether through economic activity or through transfer. Self-production and barter increases the food supply and security of millions of urban poor and improves their nutrition without making them dependent on food assistance. Local production increases physical access and may bring down the price of food due to increased supply, savings from fewer middle-men and less transportation and storage.

### Urban Farming for the Market

As poverty increases, farming for consumption within the household inevitably increases. But often, one also finds an increase in market gardening: low-income farmers supplement their income by selling some of the produce whenever possible. There is thus only a thin line of distinction between the consumption farmer and the small commercial farmer. Many farmers grow crops or raise animals for both consumption and sale simultaneously, or may target some crops and animals for sale while others are for the family to consume. Farmers sometimes begin as family gardeners and gradually begin to sell surpluses while others are market gardeners who consume their surpluses and less than perfect products.

In Africa, food sale is one of the largest economic activities in urban centres, involving more than half the enterprises (Pedersen, 1991, cited in Drakakis-Smitli, 1992). Within the urban food supply sector, urban food production is an important and often invisible sub-sector. Urban agriculture goes beyond the jobs in cultivation and animal husbandry; it generates a number of support occupations upstream and downstream from the food production proper. Schilter (1991: 159–168) found in Lome, Togo, ironsmiths specialised in forging buckets and hoes; masons who build wells; potters who create clay pots; carriers for collecting

compost as well as delivering the produce; and small merchants.

The national 1988 census found that urban agriculture in Dar es Salaam ranks as the second employer (after petty trading and day labour), with 20.2 percent of all employed (or 11 percent of the population over 10 years old) being engaged in it at least part-time. It was estimated that, annually, about 100,000 tons of food are produced locally for markets in the city (Sustainable Cities Programme, 1992), contributing 20–30 percent of its total household food supply (Sawio, 1994). In 1989, around 8,500 dairy cattle, 6,200 goats, 15,700 pigs, and over 800,000 chickens were raised in the urban region of Dar es Salaam (Mosha, 1993).

Often, low-income entrepreneurs play a key role in stocking the urban market through a variety of channels, including street food, roadside stands and municipal markets. The role of cooperation and organisation is thus particularly vital for the activities of lower-income farmers. In some places (e.g., Senegal), the men tend to the crops and the women do the processing and marketing. Members of an ethnic group in Dakar farm together the ethnic land to produce vegetables, rice, fish and livestock for the city market.

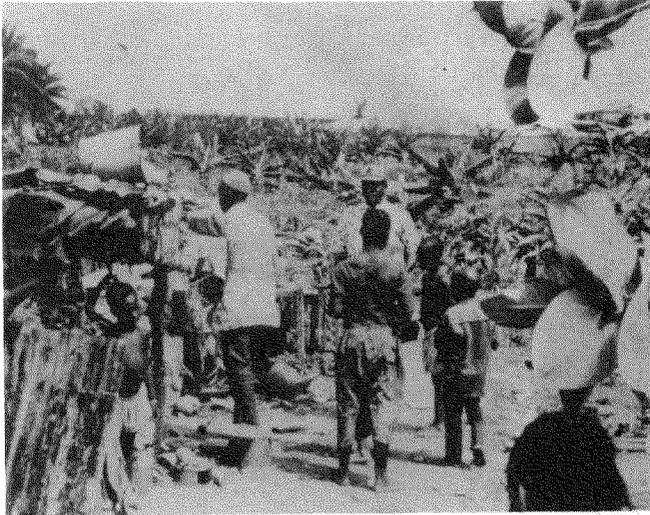
Market gardeners may come from the urban poor, middle- or upper-income groups, running from small individual enterprises to cooperatives and large intensive farming businesses. A considerable number of urban farmers are secondary-school graduates, business owners or professionals, largely the result of the economic downturn of the past quarter of century. At one urban campus in Tanzania, 70 percent of the resident faculty were engaged in agriculture (especially poultry-raising) on the side, in this case using government land.

All these entrepreneurs are running profitable farming enterprises in response to the demand in the market. Urban farmers are more competitive in perishables, higher value and specialised markets such as mushrooms, shrimp, flowers and poultry (figure 4). In these markets, physical closeness to the market, reduced transportation time and cost, access to regular market information, access to processing or export infrastructure may be some of the factors that lead to increased competitiveness of the urban farmer.

This diversification within African market gardening favoured certain farming systems in particular. Rich investors and landowners are attracted to farming systems that require high investments and produce high returns or cater to specialty markets for export. Poultry and fish production are growing very rapidly with investments from the wealthy and from foreign firms, and these ventures are supported by local banks. Thus, middle- and high-income entrepreneurial farming may be viewed by the public and by the state not as agriculture but as agribusiness. This has implications for the kind of official support the activity encounters.

After observing the way the food production and delivery system works today in Africa, how urban farming now plays a central role in it becomes clear. This is important information for both urban planners and food policy-makers. Agricultural activity has bloomed in a primarily hostile policy climate. Certain aspects of the farming are frequently illegal: growing the wrong kind of products, planting on others'

**Figure 4, Dakar, Senegal. Ornamental horticulture for the local market thrives on the roadside. Key inputs, such as clay pots and chicken manure, are locally produced**



property, using raw sewage for irrigation, sold at an unofficial market, etc... Nowadays, the urban farmers can often expect a tacit tolerance of their practices. However, the possibility usually remains that, any day, the fruits of their labour may be slashed before they are harvested. This uncertainty then affects what crops are cultivated, how much care is put into their cultivation and so on.

Where general policies, specific land-use and health decisions, and expectations regarding the enforcement of these decisions are clear to the farmer, the practice of urban cultivation and animal rearing is enhanced. The consequences of the actions of policy-makers are, therefore, of direct bearing on the further development of urban agriculture. In turn, the policy climate depends on a clear understanding by African policy-makers that urban agriculture is an essential component of the African food supply system, but also that, when improperly practised, it can have serious impacts on the urban health and environment.

Such an understanding is not completely absent in Africa. Across the continent, a number of instances could be found in the past couple of decades showing the beginning of a recognition of the actual and potential role of urban agriculture. There has been presidential decrees and declarations such as the one in Zambia in 1977 urging urban residents to grow their own food; organised national campaigns such as Operation Feed Yourself in Ghana; formal metropolitan support programmes such as those for the 'green belt' of Maputo; municipal-level agriculture departments such as the district agriculture office in Dar es Salaam and other interventions in favour of urban farming. While some of these have represented top-down approaches, many have originated from the urban food producers or their support organisations, reaching up and linking to the policy-makers.

Whether responding to a crisis or seeking to seize a perceived potential, the individual policy-maker clearly can influence, within a particular country, city or neighbourhood, the effectiveness and productivity of urban agriculture. The Town Clerk of Bulawayo (the second largest city in Zimbabwe) is one example of an enlightened policy-maker who recognised the importance of urban farming, evaluated

carefully current prevailing practices, then sought to establish an action programme to promote the activity (M. M. Ndubiwa, personal communication, 25 July 1994). This illustrates how an urban manager can act based on the knowledge that urban food production is indeed one of the basic urban functions, and that supporting it can have positive repercussions, not only on the local food supply system, but on the national one as well.

### References

- Atkinson, S.J. (1992). *Food for the Cities: Urban Nutrition Policy in Developing Countries*. Series ed. Busi Moloele. Department of Public Health and Policy. London: London School of Hygiene & Tropical Medicine.
- Diallo, S. (1993). *Urban Agriculture in West Africa: Research Review and Perspectives*. Paper presented at the "Workshop on Urban Environmental Management: Developing a Global Research Agenda", organised by IDRC, Ottawa, Canada.
- Drakakis-Smith, D. (1992). "And the Cupboard Was Bare: Food Security and Food Policy for the Urban Poor", *Geographical Journal of Zimbabwe* Vol. 23.
- Drescher, A.W. (1994). *Urban Agriculture in the Seasonal Tropics of Central Southern Africa—A Case Study of Lusaka, Zambia*. Freiburg, Germany: Institute für Physische Geographie.
- Ethelston, S. (1992). "Food Costs in Cities", *Hunger Notes* Vol. 18 No. 2.
- Guyer, J. (1987). *Feeding African Cities: Studies in Regional History*. New York: International African Library.
- Jamal, V. (1988). "Coping Under Crisis in Uganda", *International Labor Review* Vol. 127.
- Khoury-Dagher, N. (1986). *Food and Energy in Cairo: Provisioning the Poor*. Paris: The Food-Energy Nexus Programme, United Nations University.
- Kiabou, B. (1991). "Le mil, facteur d'insécurité? Les paysans de Bamako menacés d'exode urbain", *ISSN Bulletin* Vol. 358.
- Kironde, J. M. L. (1992). "Received Concepts and Theories in African Urbanisation and Management Strategies: The Struggle Continues", *Urban Studies* Vol. 29 No. 8.
- Kolstrup, H. (1985). *Urban Agriculture: Food Production and Land-Use Planning in Maputo: A Project Proposal*. Aarhus, Denmark: Masters Thesis, School of Architecture.
- Lee-Smith, D. et al. (1987). *Urban Food Production and the Cooking Fuel Situation in Urban Kenya: National Report: Results of a 1985 National Survey*. Nairobi: Mazingira Institute.

- Lourenço-Lindell, I. (1994). *Informal Food Production, Distribution and Consumption in a Peripheral District of Bissau: A Summary of a Masters Thesis*. Stockholm: Department of Human Geography, University of Stockholm.
- Manshard, W. (1992). "Agricultural Change: Market Gardens in West African Urban Communities—The Case of Ougadougou (Burkina Faso)", in Mehdi Raza (ed.) *Development and Ecology: Essays in Honour of Professor Mohammad Shafi*. Jaipur and New Delhi: Rawat Publications.
- Maxwell, D.G. (1993). *The Impact of Urban Farming in Kampala on Household Security and Nutritional Status*. Paper presented to the First Crop Science Conference for Eastern and Southern Africa, Symposium on Women and Agriculture, Kampala, Uganda.
- Maxwell, D. and S. Zziwa (1992). *Urban Farming in Africa: The Case of Kampala, Uganda*. Nairobi, Kenya: ACTS Press.
- Mbiba, B. (1994). "Institutional Responses to Uncontrolled Urban Cultivation in Harare: Prohibitive or Accommodative?", *Environment and Urbanisation* Vol. 6 No. 1.
- Memon, P. A., and D. Lee-Smith (1993). *Urban Agriculture in Kenya*. Nairobi: Mazingira Institute (Unpublished Report).
- Mosha, A.C. (1993). "Urban Farming Practices in Tanzania", *Review of Rural & Urban Planning in South & East Africa* Vol. 1.
- Mougeot, L. (1993). "Urban Food Self-Reliance: Significance and Prospects", *IDRC Reports* Vol. 21 No. 3.
- Mvena, Z.S.K. et al. (1991). *Urban Agriculture in Tanzania: A Study of Six Towns*. Morogoro, Tanzania: Draft, submitted to International Development Research Centre. Sokoine University of Agriculture, Department of Agriculture, Education & Extension.
- Pedersen, P.O. (1991). *The Distribution of Wholesale and Retail Trade in Zimbabwe's New District Service Centres*. Paper presented at the Nordic Association of Development Geographers Conference, Kungsbacka, Sweden.
- Popkin, B.M. and E. Bisgrove (1988). "Urbanisation and Nutrition in Low-Income Countries", *Food and Nutrition Bulletin* Vol. 10 No. 1.
- Sanyal, B. (1985). "Urban Agriculture: Who Cultivates and Why? A Case-Study of Lusaka, Zambia", *Food and Nutrition Bulletin* Vol. 7 No. 3.
- Sanyal, B. (1986). *Urban Cultivation in East Africa: People's Response to Urban Poverty*. Paris: The Food-Energy Nexus Programme, United Nations University.
- Sawio, C.J. (1993). *Feeding the Urban Masses?: Towards an Understanding of the Dynamics of Urban Agriculture and Land-Use Change in Dar-es-Salaam, Tanzania*. Worcester, MA: PhD dissertation. Clark University.
- Sawio, C.J. (1994). *Urban Agriculture and the Sustainable Dar es Salaam Project, Tanzania*. Paper at panel "Cities Feeding People" at "Habitat '94" conference, Edmonton, Canada.
- Schilter, C. (1991). "L'agriculture urbaine: Une activité créatrice d'emplois, en économie de survie (Le cas de Lomé)", *Cahiers des Sciences Humaines* Vol. 27 Nos 1-2.
- Smit, J. and J. Nasr (1992). "Urban Agriculture for Sustainable Cities: Using Wastes and Idle Land and Water Bodies as Resources", *Environment and Urbanisation* Vol. 4 No. 2.
- Smit, J. et al. (1996). *Urban Agriculture: Food, Jobs and Sustainable Cities*. New York: United Nations Development Programme.
- Streiffeler, F. (1991). *The Knowledge System and the Action Motives in Urban Agriculture in Sub-Saharan [sic] Africa*. Proceedings of the International Workshop on Agricultural Knowledge Systems and the Role of Extension. Hohenheim, Germany: Institut für Agrarsoziologie, Landwirtschaftliche Beratung und Angewandte Psychologie.
- Sustainable Urban Centres Programme (1992). *Dar es Salaam Environmental Profile*. Nairobi: United Nations Centre for Human Settlements.
- UN-DESIPA (1993). *World Urbanisation Prospects: The 1992 Revision*. New York: Department of Economic and Social Information and Policy Analysis, United Nations.
- UN-FAO (1984). *The State of Food and Agriculture*. Rome: United Nations Food and Agriculture Organisation.
- UN-FAO (1993). *The State of Food and Agriculture: Water Policies and Agriculture*. Rome: United Nations Food and Agriculture Organisation.
- Virji, H. and S. Schram (1994). *Agriculture and Food Security in Sub-Saharan Africa: Issues and Future Trends*. Prepared for the United Nations University Millennium Feasibility Study, Phase II. New York: United Nations University.
- von Braun, J. et al. (1993). *Urban Food Insecurity and Malnutrition in Developing Countries: Trends, Policies and Research Implications*. Washington, DC: International Food Policy Research Institute.
- World Bank (1989). *Sub-Saharan Africa: From Crisis to Sustainable Growth: A Long-Term Perspective Study*. Washington, DC: World Bank.



LYNNE RIENNER PUBLISHERS

"Africa Today has found a strong voice as a journal that successfully combines sound academic analysis with timeliness and policy relevance." —*Marina Ottaway*

# AFRICA TODAY

A multicultural journal, *Africa Today* airs the best scholarly—yet accessible—work from around the world on a full range of political, economic, and social issues. The journal is committed not only to providing information and insight, but also to offering positive solutions to the problems facing Africa today.

*Africa Today* is published quarterly.  
All articles are externally reviewed.

"Like Africa, *Africa Today* is reinventing itself. The new initiatives taken by *Africa Today* promise to make it live up to its name—and to make it one of the most refreshing, invigorating, and lively publications on Africa."

—*David Newbury*

*Angelique Haugerud, Editor*

VOLUME 45 (1998)

(4 ISSUES)

ISSN: 0001-9887

INSTITUTIONS: \$70

INDIVIDUALS: \$32

STUDENTS \$20

POSTAGE ADDITIONAL FOR SUBSCRIPTIONS OUTSIDE OF THE U.S. AND CANADA:

- \$8.00 surface
- \$20.00 airmail

ALL SUBSCRIPTIONS MUST BE PAID IN U.S. DOLLARS DRAWN ON A U.S. BANK. COLORADO RESIDENTS PLEASE ADD 3% SALES TAX.  
SPECIAL OFFER: TAKE 10% OFF ANY SUBSCRIPTION ROUTED TO THE AFRICAN CONTINENT.

#### RECENT CONTRIBUTORS INCLUDE

Robert H. Bates • Michael Chege • R. Hunt Davis, Jr.  
Jane I. Guyer • Ivan Karp • Ron Kassimir • Christopher C. Lowe  
William Martin • Julius E. Nyang'oro • M. Priscilla Stone  
Michael Watts • Michael West • Paul Tiyambe Zeleza

1800 30<sup>TH</sup> STREET • BOULDER, CO 80301 • USA • TEL (303) 444-0824 • FAX (303) 444-0824  
WWW.RIENNER.COM

## HOW DO THE URBAN POOR STAY ALIVE? FOOD PROVISION IN A SQUATTER SETTLEMENT OF BISSAU, GUINEA-BISSAU

Ilda Lourenço-Lindell

Department of Human Geography, University of Stockholm, 106 91 Stockholm, Sweden

### Abstract

Accepted May, 1996

*This study takes departure from the fact that significant parts of urban populations in the Third World have poor access to food. Approaches to food insecurity tend to be partial focusing narrowly on food availability or on people's endowment or ownership situation. This paper discusses how those in a very poor condition survive in a dominantly cash economy and a rapidly changing urban environment. In particular, the paper intends to show the importance of food gifts and poverty sharing for urban food security. It argues that command over food depends not only on availability of food and people's endowment situation but also on assistance networks, often determined by cultural codes. This exercise draws on empirical data from a squatter area of Bissau, Guinea-Bissau, collected through an eclectic methodology in which qualitative and quantitative methods are used in a complementary manner.*

### Résumé

*Cet article se distance de l'idée courante que des secteurs importants de la population dans les villes du Tiers-Monde auraient difficilement accès aux aliments dont ils ont besoin. Sans la littérature, le traitement de l'insécurité alimentaire tend à être partiel, insistant de façon un peu myope sur la disponibilité d'aliments, la dotation des gens en ressources ou leur appropriation de celles-ci. L'étude montre comment les secteurs plus démunis survivent dans une économie de marché et un milieu urbain en rapide évolution. Tout particulièrement, cet article souligne l'importante contribution des dons et du partage de nourriture à la sécurité alimentaire des pauvres dans les villes. On soutient la thèse que le contrôle de la nourriture dépend non seulement de sa disponibilité et de l'état de dotation des propres individus ou ménages mais aussi de réseaux d'entraide, souvent codifiés par la culture locale. L'argument est illustré par des données empiriques sur un bidonville de Bissau en Guinée-Bissau, recueillies grâce à une approche éclectique exploitant la complémentarité de méthodes qualitatives et quantitatives.*

### Introduction

Third World countries have been experiencing, in the last decades, an accelerated urban growth. Tropical Africa, although one of the least urbanised areas of the world, has now one of the highest rates of urbanisation. The inability of urban labour markets to absorb a rapidly increasing labour force has led to large-scale unemployment in many African urban centres. Rising levels of inflation, often in a context of deepening economic crisis and Structural Adjustment Programmes (SAPs), have been followed by a fall in real wages and purchasing power (Gilbert and Gugler, 1992 and O'Connor, 1991). This urban impoverishment has resulted in an increasing share of urban populations who fail to secure their access to purchased food, on which they depend more heavily than rural populations (Pryer and Crook, 1990). How do the urban poor survive in a dominantly cash economy with low and irregular incomes?

### Urban Food Security and Entitlements

#### (a) Entitlements to Food

The traditional approach to food security focuses on the availability of food, equating it with per capita availability of food and explaining starvation and famines with a decline

in that availability. Although there has long been a general awareness of the distinction between there *being* enough food and *having* enough food to eat, this approach continues to dominate many national diagnoses and plans for food security.

Among the studies exposing the insufficiencies of the food availability approach, the work of Sen (1980: 613–621; 1981; 1984 and 1986) has been a major contribution to the debate on food security. Besides showing empirical evidence that starvation and famines can develop without a decline in per capita food availability—which is the typical situation in Third World urban centres—this author developed the *entitlement approach*. This approach sees starvation as resulting from failure of some people to establish entitlement over a necessary amount of food. Sen introduces the notion of *command over food* which highlights the problem of unequal access to food by different groups of people and the injustice of starvation amidst abundance. He calls this an 'acquisition problem', which he seeks to grasp by focusing on the relationship of people to food and on the structure of ownership to understand starvation. According to Sen (1980: 616) "our ability to command food depends on what we own and what we can get by exchanging what we own", according to a set of entitlement relationships legitimised by the legal system ruling a given society.

---

*Acknowledgements*—I would like to thank Mats Widgren for his comments on this paper and to the Scandinavian Institute of African Studies, Hans W-Son Ahlmanns Fond and Lagrelius Fond for financing field works in Guinea-Bissau.

---

What Sen calls the *entitlement set of a person* in a private ownership economy is determined by two conditions: his/her *endowment* and his/her *exchange entitlement mapping*. The former consists of the person's bundle of ownership, that is essentially, what one produces with one's own resources, one's means of production, assets and own labour. The latter corresponds to the set of alternative bundles that one can acquire, given his/her endowment bundle. "A person is reduced to starvation if some change either in his/her endowment or exchange entitlement mapping makes it no longer possible for him/her to acquire any commodity bundle with enough food" (Sen, 1986:9). While this analysis has great relevance for Third World urban areas plagued with declining real incomes, shrinking employment and rising food prices, it does not exhaust all the ways through which people avoid starvation. In fact, although Sen states that what a person is entitled to depends on the legal and political system, economic forces and the social and cultural characteristics of a society, this statement has little consequence in his analysis. The author chooses to focus on "the system of entitlement relations operating in the economy" or possession-based entitlements and to dismiss the other not less important factors influencing one's access to food. It appears that it would be enough to make an exhaustive inventory of the endowment and exchange entitlement situation of a person to determine with precision his/her level of command over food.

Such an approach assumes that all individuals are well informed as to the market value of their assets and labour, have perfect knowledge of the market and always make economically rational decisions. Types of behaviour that do not fit this *homo economicus* model are dismissed by Sen's entitlement approach as unimportant 'choice failures' caused by ignorance or apathy. Charity, for example, is considered a non-entitlement transfer, which is not given any relevance in his analysis. It is the argument of this paper that such behaviours, considered irrational from the economic or western point of view can be of crucial importance for the food security of the urban poor. In particular, charity and safety networks give many poor access to food, regardless of their ownership situation. There is a need to explore more deeply the role of choice to enjoy or not the usufruct of one's endowment and exchange entitlement situation and to look more closely into the social and cultural codes that often underlie such choices, and in some contexts, might superimpose on capitalist behaviour.

The importance of institutional conditions which can give or deny people the ability to exercise one's ownership and exchange entitlement must be accounted for (Woldemeskel, 1990:491–495). Similarly, the importance of illegal practices such as stealing, illegal cultivation or trade should not be ignored since the poor, and the urban poor in particular, often have to resort to illegality to survive.

While some of these aspects of food security must be delayed until more mature phases of this research have been reached, the focus of this paper is on the role of 'irrational' economic behaviour and cultural obligations for avoiding starvation and improving people's access to food. This study attempts a positive approach to the problem, turning from the question *why some people fail to command enough food*,

to the question *how do the very poor manage to stay alive?* Such a positive focus is needed if future action is not only to address the causes of hunger, but also to support the popular survival mechanisms already at work.

### (b) Urban Food Security

In spite of the dimension and gravity of the urban undernutrition problem, only modest research efforts have been invested in this area of study. These have clearly been delayed due to the myopia of the availability approach. The fact that urban centres often display abundance of food and constitute the nodes through which food aid and imports are channelled has contributed to give the urban food problem a low priority in the research agenda until recently. A significant part of the literature on African urbanisation has literally ignored food security issues, even though food is the most basic of needs (Peil, 1981 and O'Connor, 1983). But a number of studies have emerged which recognise the food insecurity of the urban poor, their heavy reliance on purchased food and weak purchasing power, leaning towards Sen's entitlement theory. However, studies on the role of solidarity and safety networks for the food security of the urban poor are virtually non-existent. This paper is one first step towards closing this gap.

In this research project, food provision for the poor is addressed in a comprehensive manner, looking to the various ways they gain access to food—through purchasing it, involvement in food production, food gifts and even stealing. Much of the work on urban food supply has seen the urban population as totally dependent on food sources exterior to the urban centre (Guyer, 1992 and Pryer and Crook, 1992), but some recent studies document the relevance of agricultural activities in and around urban areas (Rogerson, 1993: 33–44 and Schilter, 1991). In particular, Rogerson (1993: 33–44) refers to the 'ruralization' of urban centres in sub-Saharan Africa in the context of economic crisis and austerity imposed by Structural Adjustment Policies (SAPs) and sees it as a result of the strategies of urban households to cope with rising living costs. Research on the distribution networks linking urban producers and consumers and the role of both urban food production and distribution in the food security of urban dwellers is very limited. These aspects of urban food supply tend to be addressed isolated from each other. The present study intends to correct this by integratively analysing household food consumption and its involvement in food production and distribution activities, understood here as interdependent components of the 'urban food system' (Drakakis-Smith, 1993).

### Research Methods

The findings presented in this paper are the result of a research strategy that uses qualitative and quantitative methods in a complementary manner. This is aimed at better grasping reality through combining the strengths and reducing the limitations of those methods. A qualitative approach will reveal food insecurity as experienced by the poor, their coping strategies, the cultural codes and the meanings behind their actions in the realm of the food economy. Quantitative methods will allow for testing the significance of a number

of variables identified through qualitative work for a wider population and will facilitate communication of research results to policy makers and more positivist researchers.

This exercise takes place in a squatter area of Bissau called Bandim. During 1992, a six-week exploratory fieldwork took place and from January to April 1995 a survey on the household food economy was carried out. The survey covered a total of 335 households corresponding to around 10 percent of the population of one squatter settlement. Households were selected on the basis of random sampling of house units, since a list of households was not available. All households living in each sampled house unit were interviewed and, if that house was part of a compound (a group of households related by kinship and a common head), all households in the compound were questioned. The *household unit* is considered here, for the purposes of the survey, as the group of people that had been eating from the same *stove* (hereinafter used interchangeably with *household*) during at least six of the twelve months prior to the survey. This unit is merely a point of entrance into a complex reality and its limits dissolve as one goes more deeply into the constellation of networks that overlap in the struggle of providing food for its members. The person of the household interviewed was the one supervising or responsible for buying and preparing the food for consumption or, alternatively, another person in the household involved in those tasks and aged 16 or more years. Qualitative interviews with households, different types and scales of food producers and traders as well as key informants both in 1992 and 1995 provided the grounds both for elaborating the survey schedule and probing the validity of its results. Although analysis of the survey data is still in process, it is already possible to present here some of the results that support the argument of this paper.

### Food Supply and the Poor in a Rapidly Changing Urban Centre

In spite of its modest size of around 200,000 inhabitants, Bissau's population is growing rapidly at an annual rate of 5 percent and accounts for 20 percent of the total population of the country (Guinea-Bissau, 1991a). After independence in 1974, the socialist one-party government concentrated investments on large-scale industrial projects around Bissau (Davila, 1987). These investments and the expansion of state employment in Bissau intensified the already accelerated growth of capital city. The failure of both to absorb a rapidly growing urban labour force resulted in rising unemployment.

In the context of a deteriorating economy and widening fiscal and external deficits, Guinea-Bissau negotiated the SAPs with the World Bank in 1986. The programme was aimed at correcting internal and external distortions of the economy, stimulating economic growth and improving the balance of payments. These aims were to be attained through exchange rate realignment, reduction of public investment and expenditure as well as trade and price liberalisation (World Bank, 1987). Thus, a radical shift from a centrally planned economy towards a liberal one has gradually taken place, with important consequences for the food sector.

The liberalisation of external trade has led to a more diversified supply of food. It has also resulted in a significant

increase of per capita availability of rice, the main staple food, largely due to a rapid growth in rice imports (Guinea-Bissau, 1991b). At the domestic level, the end of state control over trading activities has been expressed in a booming expansion of small-scale traders as well as food markets in the urban periphery, most of which are of a spontaneous nature. However, although food availability seems to have increased somewhat, it is doubtful that food security by the majority of the urban population has been improved.

SAP's policies have resulted in further unemployment and frozen salaries in the urban-based public sector (Aguilar and Zejan, 1991). This imposed austerity has hit the urban population in a particularly strong way. Guinea Bissau is experiencing an intense impoverishment process, in which a large share of its population is facing rising levels of inflation and a declining purchasing power. In this context, the endowment situation of the urban poor is of great importance to understand the relation between their loss of entitlements and their deteriorating food security. But the entitlement approach gives only an incomplete picture of the problem. One has to go beyond it to understand how the very poor, those with an endowment and exchange entitlement situation close to nil, stay alive.

### Food Provision in Bandim

#### (a) The Bandim District

The majority of Bissau's population lives in unplanned settlements lacking basic services such as electricity, sewage or running water. Bandim is the largest of these settlements, accommodating about 23,000 people (Guinea-Bissau, 1991a). Crowding in this district increased from 10.9 to 16.4 persons per house and childhood mortality was 230/1000 in 1987–1990 (United Nations Centre for Human Settlements, 1994). The survey conducted earlier in 1995 showed that 68 percent of the adults in the enquired households ate only one meal per day, that is, they ate nothing either in the morning or in the evening. This widespread practice is locally known as *the twenty-four-hour-shot*.

In spite of this poor scenario, Bandim provides significant opportunities for food production. The district includes extensive land beyond the built area which, by tradition, falls under the administration of the Papels, the dominant ethnic group. Much of this area is used for rice cultivation in salt water but many vegetable gardens also exist. The Bandim area also benefits from the proximity of the mangrove, an area rich in fish, crabs, birds and fuelwood as well as an artisanal port that supplies the city with fresh fish.

#### (b) Modes of Food Provision

The survey conducted early in 1995 intended to yield basic information on modes of food provision among Bandim dwellers for later qualitative study. One of the results elicited by the survey is the great importance of self-employment as a main source of cash income. This is hardly surprising, considering the shrinking wage employment. However, this fact deserves not to be omitted due to its importance for people's exchange entitlement. One consideration to be made is the irregularity of the incomes of the self-employed which,

for those who do not manage to keep any savings, means a varying capacity to purchase food. As a supplementary source of income to wage work, self-employment is no less important when the monthly salary is not enough to meet the food needs of an average sized household, which is definitely the case in Bissau.

More enlightening is the outstanding position of food trade (including trade of foodstuffs, drinks and directly related products such as coal) as a source of cash income for Bandim's households. Food trade constitutes the largest category among the main income activities, amounting to 37 percent of the surveyed stoves and accounts for the majority of secondary income sources. This calls attention to the double importance of urban food trade for the food security of the urban population. Not only does it make food available for purchase but also gives a large share of the urban population access to cash income with which to buy food. From the 330 household enterprises engaged in food trade, 56 percent spent more than half or virtually all of the earned income on food alone (22 and 34 percent, respectively). Many poor food retailers are caught in a vicious cycle in which they often have to 'eat' their working capital in order to stay alive, which reduces the scale of their activity and intensifies their poverty. Ironically, those food sellers operating at the smallest scale and poorest conditions are of crucial importance to the urban poor because they make available small amounts and/or low cost foods that the latter can afford on a daily basis.

In the face of declining purchasing power, the importance of alternative sources of food for the poor is probably increasing. While this trend is not as yet easy to prove, the survey data is quite elucidative about the involvement of Bandim's dwellers in food production. About 33 percent of the inquired households had members involved in farming during the twelve months prior to the survey, 52 percent had raised livestock and 39 percent had engaged in picking fruits. Fishing activities in Bandim are another important component of the quarter's food economy not so much because of the amount of population actually involved (only 8 percent of the surveyed stoves had practised it), but because it is a source of income for a large number of fish retailers and an important source of fresh fish for Bissau (Guinea-Bissau, 1991a).

Food production by urban dwellers is an important component in their food security. Such activities provide the urban poor with foodstuffs that they otherwise might not be able to afford and reduce their dependency on purchased food through direct entitlement to what they produce. They also diversify their diets and occasionally generate some cash to pay for other basic items. The latter is clearly the case of livestock raising, which often constitutes a safety valve, generating cash to buy the basic staple in times of hardship. In the case of rice farmers in Bandim, who often have limited access to cash, subsistence rice farming provides them and their dependents with the main constituent of their meals. But urban food production goes beyond the subsistence level, although the relative weight of subsistence and commercial production varies from one product to another. Market-oriented food production in the urban centre improves availability of fresh foods for the urban population and the

exchange entitlement of its practitioners. In Bandim, among the 114 farming households surveyed (34 percent of the sample), 40 percent sold more than half of the production and of these 39 percent spent most of the resulting incomes on food.

Whether urban food producers are the poorest of the poor needs further investigation. While it can be argued that food production demands access to resources, such as land, out of the reach of the poor, a closer look at the nature of such access is required. Many food production activities in Bandim are carried out with few cash expenses, with borrowed inputs and based on solidarity ties. Solidarity is the piece of the puzzle missing in most analyses of food security.

In rice farming in Bandim, mutual help between farming households of the same ethnic group is important in providing labour for the working seasons, in borrowing tools, exchanging seeds and protecting the paddy from birds. Land for rice production is still to some extent distributed by the local elders and plots for gardening are often borrowed or rented from them for symbolic prices. Canoe fisheries imply higher expenses but there is similarly much mutual assistance between fishermen, without which many could not operate. To offer a part of the catch to relatives (not belonging to the fisherman's household) or to a fellow fisherman who was not able to go out fishing is a common practice.

Thus, different components of the food economy show networks of assistance with different configurations. The food security of a household reflects the constellation of these networks that go far beyond its limits. But let us now focus on those solidarity bonds that directly affect provision of food for consumption. Depending exclusively on gifts to meet one's food needs is one mode of food provision in Bandim and deserves therefore attention. Moreover, a large share of households depends to a greater or lesser degree on food gifts. About 68 percent of the surveyed households declared that they had received gifts in cash, food or meals in the twelve months prior to the survey. This seems, however, a low figure considering that it is usual to share meals daily with the neighbouring stoves, which many respondents did not regard as gifts.

Relatives and neighbours were the dominant source of those gifts (95 percent), belonging mainly to other households living in the same house or compound (73 percent) but also in other parts of Bandim and Bissau. It is important to notice that 11 percent of the households had received gifts with origin outside of Bissau. The frequency of these gifts varied between one to several times a year and often depended on visits to those areas. Transfers in the opposite direction, that is, from the surveyed households involved in food production to their rural areas of origin, were also seldom mentioned—only 7 percent of the farming households reported to do so. Most of the gifts of the enquired food producers are directed to other stoves in the same house or compound or within Bandim.

When asked what they did when they had no food to eat or money to buy it, 43 percent of the respondents asked for food or money from other households living in the same house or compound and 32 percent turned to other relatives and neighbours in the urban centre. Particularly the first figure

seems to underestimate reality, especially considering that 68 percent declared receiving gifts in the last twelve months. This is due to people's reluctance to ask for food and to admit that they, nevertheless, rely on the moral obligation of neighbours to offer them some food if they have none.

These moral obligations concerning food gifts reaches such a dimension that can hardly be understood by the western mind. About 90 percent of the surveyed households declared they offered food to people in need even if the remaining food would not be enough to meet the needs of the household. This poverty sharing is of crucial importance for the poor because it is the guarantee that they will virtually always find something to eat. For the donor, it represents a social capital/investment to which he/she can appeal for in times of shortage.

### **(c) Freedom of Choice and Culturally-Based Entitlements**

The above set of data indicates these bonds of assistance are stronger between stoves sharing the same roof and belonging to the same compound. Many households in Bandim are still organised in compounds—a group of stoves interrelated through kinship and a common head—the traditional form of residential in the country. The degree of assistance between stoves sharing the same house varies greatly, depending on possible kinship ties, length of living together and friendship. But particularly within the compound there are traces of traditional systems of assistance, eventually partly eroded by the influences of urbanisation, in mutual assistance. There is a division of rights and duties in the compound that determines what type of assistance one member can expect from another in case of need. Similarly, one can differentiate the providers and the beneficiaries within the stove unit. These culturally determined systems are being studied through qualitative methods, but due to their complexity (they are different for the different ethnic groups living in Bandim), more qualitative work has to be carried out before a full account can be given. But it is clear that such cultural obligations should not be ignored because in some contexts they are of critical importance to the survival of the poor. The entitlement approach dismisses such non-market oriented behaviour by focusing on endowment and exchange entitlement. It is necessary to extend Sen's largely possession-based entitlement concept to incorporate these socially- and culturally-based entitlements. These entitlements are not determined by one's endowment situation but by a set of legitimate claims that one can make to different entities in the community and society to provide one with food.

One aspect that stands out in these findings is the prominent role of the household and the community (understood here simply as the neighbours and the kin group in the compound or within reach) as basic institutions for the provision of food, an essential area of social reproduction. This reality acquires new meaning in a time when the state is officially withdrawing itself from former responsibilities, such as subsidising rice to public sector workers.

Another important reflection is the non-profit logic and 'unrational' economic character of a significant part of food

provision in Bandim. This is evident in the way many food producers use their production. About 74 percent of the households involved in cultivation and fisheries gave away part of their production even if it was not enough to sell. Rice farmers, in particular, refuse to sell an eventual surplus. They tend to keep it not only for the next cultivation cycle but also for gifts and for cultural ceremonies—peace with the supernatural world is perceived as a requisite for well-being. Similar considerations can be made about how the poor handle their assets. It is common that an impoverished house owner will not charge rent from households that are related to him/her by kinship or are in an equally poor situation. It is also not probable that a person who is out of cash will sell his/her house or land in order to buy food. The entitlement approach does not account for choices which are not coherent with market principles and remains at a somewhat utopic level detached from reality.

By focusing on those means of commanding food that are legitimised by the legal system governing a given society, Sen underestimates the importance of illegal practices that might constitute an important mode of food provision. For example, 13 percent of the inquired households had reported thefts of food in the past twelve months, but the number would be much higher if other assets had been included. Informal references to such thefts were numerous. Such activities represent a loss of entitlements by the victimised households and a means of gaining access to food for others. One possible consequence is that members of already poor households might be deprived from earning an income in case they have to stay home to protect their properties (considering the low level of security of the houses of the poor). The poor are also those less able to defend their own legal rights, which often results in losses of entitlements and reflects their political (not only economical) marginalisation. The political nature of command over food is also evident in the differentiated access people have to social resources and networks of assistance, such as the compound and the kin group.

### **Conclusion**

What determines the mode of food provision of one household is the ultimate challenge in this study. Which modes of food provision are the most resilient to starvation is another important question that needs further research before an answer can be formulated.

I have here deliberately focused on the positive side of the influence of culture and tradition in food provision. But one must not ignore their less positive effects on people's lives. Traditional relations in some food production activities in Bandim give an unfavourable position to youth and women, who have poor control over productive resources and weak decision-making powers. Another example is the diet taboos and the concentrated consumption of meat during cultural ceremonies. The interaction of these traditional elements with the modern urban environment are the source of struggles and conflicts which reflect the process of conservation and dissolution that is typical of many peri-urban areas. Are these cultural bonds of assistance in food provision eroding under the influence of urbanisation or reinforcing in the face of the

current austerity and deterioration of living standards? The answer to this question is of crucial importance to the future survival of the poor.

### References

- Aguilar, R. and M. Zejan (1991). *Guinea-Bissau: A Fresh Start?* Gothenburg: Department of Economics. Unpublished PhD thesis.
- Davila, J. (1987). *Shelter, Poverty and African Revolutionary Socialism: Human Settlements in Guinea-Bissau*. London: International Institute for Environment and Development.
- Drakakis-Smith, D. (1993). "Food Security and Food Policy for the Urban Poor", in J. Dahl et al. (eds) *Land, Food and Basic Needs in Developing Countries*. Göteborg: Department of Human and Economic Geography, University of Göteborg.
- Gilbert, A. and J. Gugler (1992). *Cities. Poverty and Development Urbanisation in the Third World*. Oxford: Oxford University Press.
- Guyer, J. (1992). *Feeding African Cities*. London: The International African Institute.
- Guinea-Bissau (1991a). *Recenseamento Geral da População e Habitação*. Bissau: Instituto Nacional de Estatística e Censo.
- Guinea-Bissau (1991b) *Plan Cerealier de la Guinée-Bissau*. Paris: CILSS et MDRA.
- O'Connor, A. (1983). *The African City*. London: Hutchinson University Library for Africa.
- O'Connor, A. (1991). *Poverty in Africa: A Geographical Approach*. London: Belhaven Press.
- Peil, M. (1981). *Cities and Suburbs: Urban Life in West Africa*. New York: Africana Publishing Company.
- Pryer, J. and N. Crook (1990). *Cities of Hunger: Urban Malnutrition in Developing Countries*. Oxford: Oxfam.
- Rogerson, C. (1993). "Urban Agriculture in South Africa: Policy Issues from the International Experience", *Development Southern Africa* Vol.10 No.1.
- Schilter, C. (1991). *L'Agriculture Urbaine à Lomé*. Paris: Karthala.
- Sen, A. (1980). "Famines", *World Development*, Vol. 8.
- Sen, A. (1981). *Poverty and Famines: An Essay on Entitlement and Deprivation*. London: Oxford University Press.
- Sen, A. (1984). *Resources, Values and Development*. Oxford: Basil Blackwell Publisher Ltd.
- Sen, A. (1986). *Food, Economics and Entitlements*. Finland: World Institute for Development Economics Research.
- United Nations Centre for Human Settlements (1994). *Crowding and Health in Low-Income Settlements, Case Study Report, Bissau, Preliminary Draft*, 1994. Nairobi: UNCHS, Habitat.
- Woldemeskel, G. (1990). "Famine and the Two Faces of Entitlement: A Comment on Sen", *World Development* Vol. 18 No. 3.
- World Bank (1987). *Guinea-Bissau: A Prescription for Comprehensive Adjustment. A World Bank Country Report*. Washington, DC: World Bank.



# Community Development Journal

Volume 33 1998 4 issues

Edited by K. Popple, University of Plymouth

To find out more about **Community Development Journal**  
please visit our web site at

<http://www.oup.co.uk/cdj>

where you can register to receive the forthcoming table of  
contents by e-mail, whether you subscribe or not.

Published by Oxford University Press

TO SEND FOR A FREE SAMPLE COPY SIMPLY PHOTOCOPY THIS FORM  
AND SEND OR FAX IT TO THE ADDRESS BELOW

**Oxford University Press**  
Journals Marketing X98  
Great Clarendon Street  
Oxford OX2 6DP  
Fax: 01865 267485

Please send me a free sample copy of:  
**Community Development Journal**

Name.....

Address.....

.....

City/County.....

Postcode.....

## URBAN AGRICULTURE, FOOD SECURITY AND NUTRITION IN LOW INCOME AREAS OF THE CITY OF NAIROBI, KENYA

Alice Mboganie-Mwangi and Dick Foeken, respectively

Unit of Applied Nutrition, University of Nairobi, P.O. Box 30197, Nairobi, Kenya; and  
African Studies Centre, P.O. Box 9555, 2300 RB Leiden, The Netherlands

### Abstract

Accepted December, 1995

*This article discusses how far farming activities performed by low income dwellers within the City of Nairobi play a role in the food security and nutritional condition of the households involved. A comparison is made between three low income groups, i.e. those who do practice urban farming, those who do not, and a group involved in an urban farming project. The results show that as far as food security is concerned urban farming does play a prominent role, but this is not translated in a better nutritional condition of the young children.*

### Résumé

*Cet article traite de la mesure dans laquelle les activités agricoles pratiquées par les citoyens de bas revenus, en deçà des limites de la ville de Nairobi, contribuent à la sécurité alimentaire et à la nutrition des ménages impliqués. L'étude tisse une comparaison entre trois groupes à bas revenus: ceux qui pratiquent l'agriculture urbaine, ceux qui ne la pratiquent point et un troisième groupe, engagé dans un projet d'agriculture urbaine. Les résultats montrent que l'agriculture urbaine contribue à la sécurité alimentaire des ménages, même si la condition nutritionnelle des jeunes enfants dans les ménages pratiquants n'est pas nettement supérieure à celle des enfants dans les ménages non-producteurs.*

### Introduction

Until recently, urban agriculture—which can be defined as any farming technique in an urban environment (Maxwell and Zziwa, 1992b)—was believed to be an insignificant cultural practice carried over from the rural areas and was ignored by academics and planners. Recent research, however, suggests that urban agriculture is potentially a livelihood-enhancing strategy for the low income urban dwellers (Sawio, 1993: 59–82). Urban agriculture is usually an activity unplanned and uncontrolled by the state. Apart from farming in backyards (mainly by those with some unused land space on their compounds) and farming in rural areas which became part of the urban area due to the expansion of the urban boundaries (Memon and Lee-Smith, 1993: 25–42, term as 'urban farmers' these traditional landowners or farmers), it involves food production on idle and/or reserved land as a mode of survival by many low income urban people. It is this latter type of urban agriculture that this article is concerned with.

In East and Central Africa, urban farming has been practised since the late 1960s and early 1970s (Sawio, 1993: 59–82). It has been officially recognised in Zambia but attempts to bar it surface from time to time (Sanyal, 1987 and Rakodi, 1985: 53–61 and 1988: 495–515). Studies carried out in this region reveal that a majority of the farmers are women of low socioeconomic class. Urban agriculture tends to be a livelihood strategy to supplement their inadequate incomes by producing food on any available land (Sanyal, 1987; Rakodi, 1988: 495–515; Drakakis-Smith, 1992: 258–283 and Maxwell and Zziwa, 1992a: 91–109). Crops produced include mainly vegetables and fruits plus some legumes and root crops (Mlozi et al., 1992: 284–294 and Maxwell and Zziwa, 1992b). In Tanzania, milk and poultry have been reported to be produced in urban areas (Mlozi et

al., 1992:284–294), while goats, rabbits and poultry have also been reported in Kampala, Uganda (Maxwell and Zziwa, 1992b) and Harare (Drakakis-Smith, 1992: 258–283).

Farming within the City of Nairobi is not a new phenomenon except that its intensity increased in the late 1980s. Food prices partly explained the rapid increase in the cultivation of open sites, backyards, river valleys, road and rail reserves in city and other urban areas in Kenya (Lee-Smith et al., 1987). Freeman (1991) observed that farmers growing crops had curved out irregular boundaries for their plots depending on who came first. Some operated on public land leased to them by 'landlords' at a rent as high as Ksh. 1,000 per annum (Gathuru, 1988). Another study revealed that the majority of such farmers are women, very poor, landless and subsistence dwellers while farming at the backyard of residential houses is a characteristic of a few middle and upper socioeconomic groups as these can afford housing with unused land space (Lado, 1990:257–266). A survey carried out in Kiambu District, Kenya indicated that such factors as family size, landlessness, unemployment and the need to grow food crops for domestic consumption and for sale to obtain a cash income motivated farmers (mainly females) to encroach on roadside reserves as a means of sustaining their livelihoods (Mutisya and Lado, 1991:107–127).

Most studies pointed at problems of land tenure for the poor urban farmers. They 'illegally' farm on land that does not belong to them hence they are faced with problems of crop and/or livestock insecurity. In the general survey on urban agriculture in Kenya carried in 1985 by Lee-Smith et al. (1987), 6 percent of the urban farmers mentioned to have experienced eviction from their plots by the landowner or municipality. In the City of Nairobi, this applied to only 3 percent of the respondents.

Until now, very few studies focused on the food consumption and/or nutritional condition of poor urban dwellers. Alarcon and Rivera (1994:171–182), studying the impact of changes in purchasing power on food consumption of an urban population in Guatemala City found that the mean energy intake for households with the lowest incomes ranged from 70 percent to 78 percent of the requirements and protein intake from 92 percent to 106 percent of the recommended level. Atuanya (1987:109–127) carried out a dietary survey of the urban poor in Benin City, Nigeria and found that, on average, daily individual calorie intake was about 75 percent of the requirements and the average protein intake was also less than the recommended safe level.

The potential contribution of urban agriculture to the food supply of the urban population, in particular the urban poor who practice it as a survival strategy, is revealed in various studies. Sachs and Silk (1990) cited a number of studies that highlight the importance of urban agriculture in several countries. For instance, urban agriculture has been shown to improve vitamin A levels in diets in many Asian countries, such as Indonesia (Yeung, 1987: 14–23). In some small urban gardening projects such as in Argentina, high yields were obtained, while livestock could be fed with the waste from the gardens (Wade, 1987: 29–35).

Several surveys conducted in 1990–1992 in low income areas of the City of Nairobi revealed that malnutrition among young children was quite common. The prevalence of wasting among children aged 6–60 months ranged from 5 percent to 13 percent (the national rural figure in 1987 being 2.5 percent) and stunting from 10 percent to 57 percent (19.6 percent in Kenya as a whole; Kenya, 1991). In 1992, the level of wasting in Kawangware, a low income area in the southwest of the City of Nairobi was 8.3 percent (Kenya/UNICEF, 1992).

Past studies on urban agriculture in Kenya have concentrated either on the urban agricultural activities of the urban population in general, i.e. in all segments of the urban population (Lee Smith et al., 1987) or on urban producers only (Lado, 1990: 257–266 and Freeman, 1991). The latter studies focused on the characteristics of the producers (i.e. household and/or individual characteristics) and of the agricultural activities (i.e., types of crops, destination of the produce and land security, among others). A more recent study in Kibera (a slum settlement in the City of Nairobi) by Dennery (1995) focused on factors affecting the decisions and actions of urban farmers. Little is known, however, about (a) the extent to which urban agriculture as a food source contributes to household food security, consumption and nutritional status among low income urban populations, and (b) how the low income urban farmers compare with their non-farming counterparts in this respect. The present article tries to bridge this gap and contributes to the existing knowledge concerning urban agriculture in the City of Nairobi in at least three ways: (a) it focuses on low income households only; (b) it compares households engaged in urban agriculture with households not performing any type of agriculture within the urban boundaries, and (c) it includes a group of households taking part in a special urban agriculture programme.

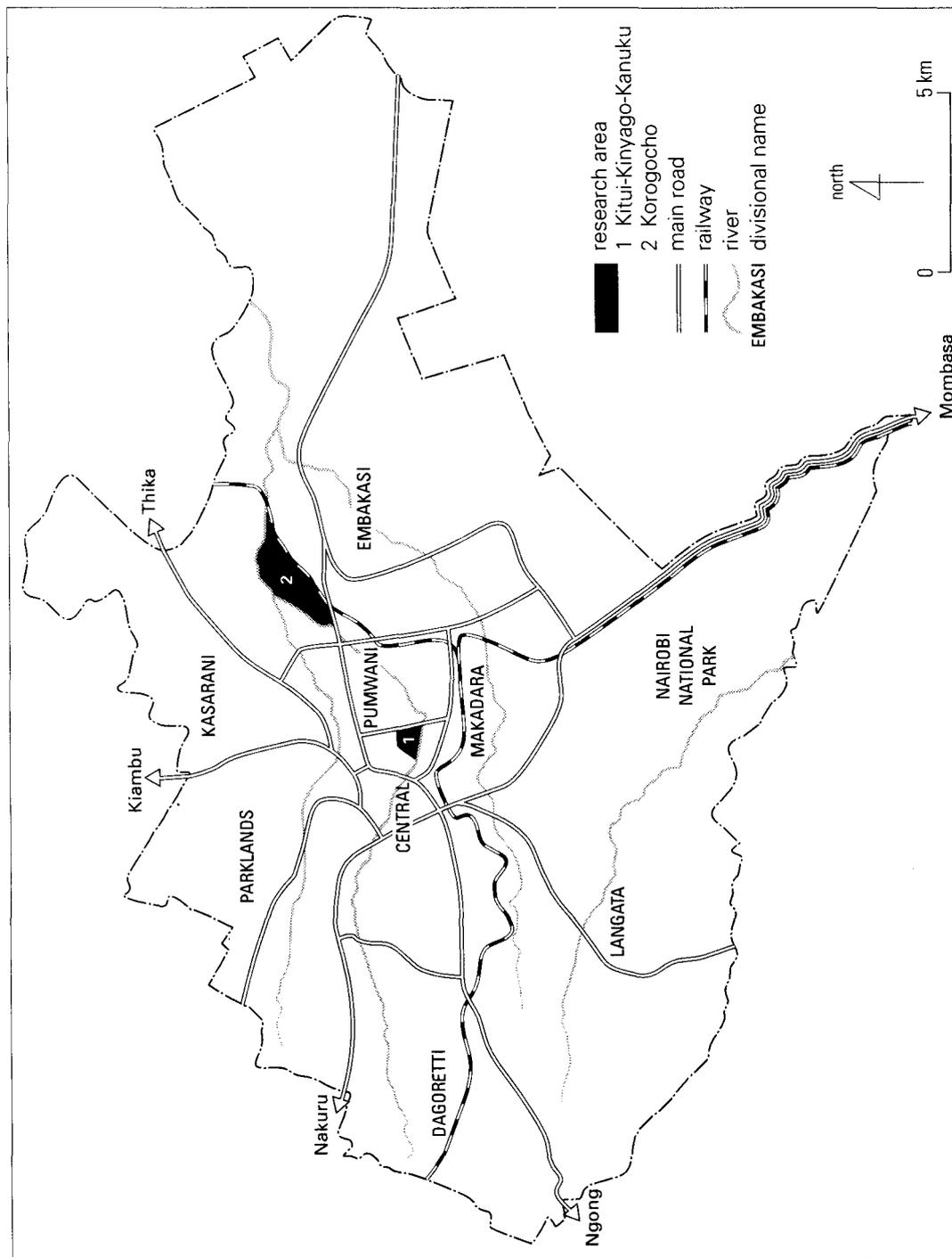
### **Study Areas**

The study was conducted in the City of Nairobi and covered two cluster areas that had already been identified with poverty: Korogocho and the Kitui-Kanuku-Kinyago area (figure 1). Korogocho area was intentionally selected from a list of already identified poor urban zones in the City of Nairobi. Its selection was based on the fact that there was an adequate number of households practising urban agriculture. It served as a typical low income area without any agricultural influence from Nongovernmental Organisations (NGOs) and its agricultural activities were purely self-initiated. The area is located about eight kilometres from the urban centre, towards the northeast. Its population was estimated at 75,000 in 1990 (World Vision International, 1990). Among the poor districts of the City of Nairobi, Korogocho has been shown to have the lowest monthly income per household head (Kenya/UNICEF, 1990).

The Kitui-Kanuku-Kinyago area is situated three kilometres from the city centre. The combined villages were estimated to have 10,000 households with more than 40,000 people living there. These were the villages involved in the so-called Undugu Society Urban Agriculture Project (USUAP). The USUAP is part of a wider project on slum development and organised by the Undugu Society of Kenya (USK) for 'underprivileged' people living in the low income areas. The USK started as a small parking boys (street boys) scheme launched in 1975/76. It has now developed into an extensive low income development project. The USUAP started in 1988 and its aim was to provide household level food security for the households involved. The initial target areas were the three slum villages Kitui-Pumwani, Kanuku and Kinyago located on the eastern side of the City of Nairobi. Plots with a size of 165 square metres (3 x 55 m) along the Nairobi River were allocated through the local government to 105 low income households. The individuals were given agricultural result demonstrations and assistance on the plots for a period of two years and left to continue on their own with only technical advice from the USK. The technologies offered were mainly biointensive including organic manure composting and pesticide formulation (Personal communication, 1993). Crops grown were meant to be mainly vegetables for consumption and the surplus for sale.

The Korogocho area provided two types of households, namely, low income urban households practising self-initiated urban farming activities (the so-called 'Korogocho farmers') and households not practising any urban farming (the 'Korogocho non-farmers'). Three villages were randomly selected from a total of seven villages and all the households in these villages were listed. It was found that 30 percent of the households could be classified as urban farmers. From both 'farmers' and 'non-farmers', 70 households were randomly selected. From the Kitui-Kanuku-Kinyago households involved in the USUAP, another 70 households were randomly selected (the so-called 'USUAP farmers'). During the analysis it appeared that some households from the Korogocho farming group had to be dropped because it

Figure 1, The city of Nairobi, Kenya, showing the research area



Map1 Nairobi Source: Matrix Development Consultants, 1993

was found that some of them had only a few poultry (less than 5) and did not practice any form of urban cultivation. Due to this and to unreliable responses, the final number of households involved were 48 Korogocho farmers, 67 Korogocho non-farmers and 62 USUAP farmers.

Data were collected with the use of an interviewer-administered questionnaire and the head's wife or the female head in the household as the main respondent (the male household head was required to respond whenever necessary). The head's wife or female head was selected as respondent because she is usually responsible for food production and preparation; hence, she is the best respondent especially where household food preparation and consumption issues are at stake.

### Demographic Characteristics

Table 1 shows some selected demographic characteristics of the three study groups. In general, the non-farmers households appear to be less far in the 'family life cycle': households are smaller, household heads are younger and there are more young children. Moreover and probably related to this, most of the heads in this group arrived later in the City of Nairobi than the heads in the two farming groups, one-third of them after 1986. This in itself may be one of the reasons for not having access to land: they came at a time when a lot of potential farming land was already occupied while in general they are less 'settled' in the city than those who stayed longer. As far as the educational level of the household heads is concerned, the highest level was found among the Korogocho non-farmers as the large majority of them had at least upper primary school level of education. The female heads among the non-farmers were also better educated than the rest since 14 percent of them had attained post-primary school education compared to 5 percent among the urban farming households. Even though the (few) heads with post-secondary school education were all found in the USUAP group, one-third of the heads in this group had received no education at all.

There appeared to be a distinct ethnic clustering among the groups. Most of the inhabitants of the USUAP villages are Kikuyu (90 percent) who have been in the City of Nairobi for a longer time than their Korogocho counterparts. The Korogocho farming group consisted for about half of Kikuyu, one-third of Luo and the rest of other ethnic groups such as Luhya, Akamba and Somali. Among the Korogocho non-farmers, however, the Luo dominated (60 percent) while the

Kikuyu formed the largest minority (30 percent). Although the ability to acquire urban land for farming seems to be influenced by the length of stay in the city, even those who may not have stayed in the city for a long time may acquire plots through ethnic acquaintances. On certain occasions in the Korogocho fields, it was said that if a Kikuyu wanted to stop tilling a certain plot, it would be 'sold' to somebody of the same ethnic group as the incoming farmer. If in any case the plot was passed on to somebody of different ethnicity, sometimes the new individual would be phased out by those farming the surrounding plots by 'digging into the plot' from all sides. Although this is not representative of all the farmers, it has some bearing as to why mostly Kikuyu are urban farmers. A Luo non-farmer in Korogocho complained to have been phased out in this manner.

### Household Resources

In all groups, most household members were involved in informal trade and food selling (table 2). This consisted of street hawking and kiosk and market selling of raw and cooked foods, new and second hand clothes, other household items, collecting and selling of urban waste for recycling (e.g. waste paper, empty bottles, old plastics and shoe soles, among others) and shoe repair. Among the Korogocho groups, casual labour was the second important activity. Few household members had found employment in the formal sector, especially in the non-farmers' group (and despite their comparatively high level of education). Most formally employed persons were from the USUAP group, although no more than one-quarter of the adult population. Informal manufacturing (carpentry, metalwork and handicraft) and illegal trade and practices were more common among the non-farmers as compared to the farmers. Illegal trade and practices included activities like manufacture and selling of alcoholic brews, prostitution, street begging and stealing. Finally, urban farming was also mentioned as a source of income, especially in the Korogocho farming households. For the USUAP households, urban farming was quite marginal as an income source.

Using the monetary income generated from activities in which household members were involved in 1993, a rough estimation of the average monthly household income could be made. The kind of income-generating activities the household members were practising were not very rewarding. The large majority (85 percent) of the individuals earning a cash income in 1993 had an average monthly income of less

(N=)	Korogocho farmers (48)	Korogocho non-farmers (67)	USUAP farmers (62)
• average household size (no. of persons)	6.9	5.6	6.8
• average age of household head (years)	39	32	45
• no. of hh. members younger than 5 years	1.3	1.7	1.0
• % hh. heads born outside Nairobi	90	78	73
• % hh. heads at least 15 years in Nairobi*	63	39	85
• % hh. heads with at least mid-primary school	69	85	49

\* Only those born outside Nairobi  
Source: Supplied by the authors

than Ksh. 3,000. Only such activities as illegal alcohol brewing and selling, trading in used clothes and informal manufacturing seemed to be more promising, but few people had an income out of that. As a result, the average household income was also low. However, the groups differed substantially in this respect: with about Ksh. 2,700, the average monthly income in the USUAP group was almost 40 percent higher than in the Korogocho groups (about Ksh. 2,000). A look at the income distribution shows that the percentage of households with very low incomes, i.e. below Ksh. 2,500 per month was by far the highest among the non-farmers (table 2).

Since income is usually not reliably estimated, a very simple welfare index was developed by means of the ownership of certain items which appeared to have a discriminative value.<sup>1</sup> Table 2 shows that particularly among the non-farmers the percentage of households with a low welfare index was very high indeed.

The average size of the urban plot(s) was quite modest (table 2). The Korogocho farmers cultivated an area of on average 3,200 square metres (0.4 acres) while the plot size of the USUAP farmers was less than half of that. In addition, many households claimed to have access to land in the rural areas. This applied particularly to the non-farmers. At the same time, however, for two-thirds of the latter, the rural plot(s) formed neither a food nor an income source. This is likely related to the fact that most non-farmers originated from the area around Lake Victoria, i.e. too far from Nairobi to be able to exploit the land.

### Urban Farming Activities

All urban farmers in both groups except one in the Korogocho group practised urban farming because they were in need of food. About one third of the farmers indicated that they also needed income. This indicates that urban poor households produced mainly for home consumption. Hence, crops grown were predominantly the basic foodstuffs like maize and beans, a finding comparable with that of Lee-Smith et al. (1987) 10 years earlier. An important vegetable concerned kale (*sukuma wiki*) which is usually consumed together with *ugali*, a thick paste made from maize meal. Potatoes and arrowroot also appeared to be important crops. For all the crops grown, most of the produce was consumed at home; in other words, urban agriculture may be said to be mainly for own consumption. This, again, is in line with the

finding of Lee-Smith et al. (1987) that 90 percent of the City of Nairobi urban farmers consumed the crops they produced while only 21 percent sold any part of their produce.

Livestock rearing did not appear to be important. Only a few individuals had some cattle, sheep and goats, poultry and rabbits mainly for home consumption. The major hindrance was the lack of space for keeping animals. Housing units were so squeezed together that there was no space for even children to play, leave alone keeping livestock. Ten years ago, the same pattern was found: 7 percent of the City of Nairobi households reared some livestock and the major constraint was also lack of access to land space (Lee-Smith et al., 1987).

Despite the urban agriculture project launched by the USK, the use of modern inputs among the USUAP farmers was less common than among the Korogocho farmers. There was more use of chemical fertiliser, improved seeds/seedlings, improved breeds and use of feed supplements in Korogocho. Use of natural pesticides was more common in the USUAP group. This may be because the USK advocates a bio-intensive kind of agriculture (i.e. where urban waste is recycled and used as fertiliser, pesticides and even as seedlings). Another reason may be, as Lee-Smith et al. (1987) point out, that many urban plots are too small to justify use of modern inputs. In their study, most of the farmers who used inputs tended to have larger plots than those who did not.

The major problem faced by urban farmers was theft (besides such problems as pests and diseases, lack of capital, and 'plots used as toilets', particularly in the USUAP areas). General discussions revealed that a substantial proportion of the maize and beans were harvested and consumed or sold before they were fully mature to avoid loss through theft. Thus, theft is very important in that it forces the cultivators to harvest crops with low caloric value. This finding contrasted with that of Lee-Smith et al. (1987), where the most important problem was that the crops were destroyed by animals. The explanation for this may be that at the time (mid-1980s) Lee-Smith and her colleagues carried out their study, the economic situation in Kenya was more stable and better. The recent declining economic situation in Kenya may have escalated the problem of poverty and hunger in the urban areas such that the problem of theft has outgrown the problem of animals destroying the crops. Eviction, like in Lee-Smith et al.'s (1987) study, did not appear to be a major problem.

Table 2. Household Resources by Study Group

(N=)	Korogocho farmers (48)	Korogocho non-farmers (67)	USUAP farmers (62)
• % persons with formal employment	15	6	24
• % persons doing casual labour	58	43	19
• % persons doing informal trade & food selling	60	45	86
• % hhs with monthly income below Ksh.2,500	31	60	34
• % hhs with low welfare index*	69	90	57
• average size urban plot(s) (sq. metres)	3,200	-	1,400
• % hhs with access to rural land	50	75	40

\* Based on the ownership of certain items (see footnote 1 and Mboganie 1995: 72)

Source: Compiled by the authors

### Food Security

To get a general impression of the level of food security as perceived by the three categories of households, several general questions regarding food availability were asked. Table 3 gives a summary. It is clear that the food situation of the USUAP farming group was generally better than that of the two Korogocho groups. Asked how they coped with food shortages, almost half of the USUAP farmers claimed that they never experienced drastic food shortages to warrant a change of behaviour. For those USUAP households who did face food problems, the most important strategy was buying food on credit implying that they were optimistic about obtaining some monetary income later on to pay the debts. The Korogocho farmers employed a wide range of strategies. The non-farmers, however, had to rely mainly on such poverty-indicating strategies as going for donations and hawking.

In all three groups, purchased food formed by far the most important food source (table 3). Nevertheless, one-quarter of the Korogocho farmers indicated that their own farming activities within the urban boundaries comprised their main food source. For the USUAP group, this percentage was lower, which can undoubtedly be related to the smaller plots they have at their disposal.

### Food Consumption

The actual food consumption in each household was recorded for the whole week prior to the day of the interview. Since most of the interviewing took place in July and August of 1994, the data give a fairly accurate picture of the actual food consumption during these two months. Since food

ingredients differ in their nutrient composition (i.e., water content, energy content, mineral content and protein content among others), they are converted into nutrient equivalents for assessment of the quantity of nutrients consumed. In addition, household nutrient requirements vary since households differ in size, sex and age distribution and other factors that influence their nutritional needs. Therefore, for analysis of survey findings, household size is standardised in terms of the number of consumer units. Thus below, the foods consumed are expressed in kilocalories of energy and grams of protein per consumer unit per day.<sup>2</sup>

On average, all three groups had inadequate energy intake (table 4). Average kilocaloric intake was less than 75 percent of the estimated requirements. Average protein intake, on the other hand, seemed to be adequate for all groups.<sup>3</sup> These results are comparable with those found in other urban centres in developing countries (Alarcon and Rivera, 1994: 171–182 and Atuanya, 1987: 109–127). The finding that average energy intake is below and average protein intake is above the recommended level should not be a surprise since other studies, especially among the rural poor, have revealed the same pattern (see for example Foeken and Tellegen, 1992 and Hoorweg et al., 1991).

Although energy intake among all three groups was inadequate, differences were observed between the groups in the sense that the energy and protein intakes in the USUAP group were higher than in the other two groups.<sup>4</sup> And as far as protein intake is concerned, the proportion of households consuming less than the recommended safe level was highest in the non-farming group and lowest in the USUAP households.

**Table 3, General Food Security Issues by Study Group in Percentages**

(N=)	Korogocho farmers (48)	Korogocho non-farmers (67)	USUAP farmers (62)
• "Always or most of the time enough to eat"	35	25	71
• "Do not require any improvement in food situation"	13	6	27
• "Go for food donations or hawking during food shortage"	31	66	24
• "Most important food source during past 3 years":			
- purchased food	67	82	68
- own urban production	25	-	16

Source: Compiled by the authors

**Table 4, Estimated Daily Energy and Protein Intake Per Consumer Unit by Study Group**

(N=)	Korogocho farmers (48)	Korogocho non-farmers (67)	USUAP farmers (62)
• Average household size in consumer units (cu)	4.8	3.7	4.3
<i>Energy intake</i>			
• Average intake (kcal/cu/day)	1,904	1,804	2,151
• % of requirements*	64	61	73
• % hhs with intake <75% of requirements*	70	67	64
<i>Protein intake</i>			
• Average intake (grams/cu/day)	62	61	66
• % of recommended level*	123	122	132
• % hhs with intake <75% of recommended level*	22	30	18

\* Energy requirements are estimated at 2,960 kcal/day per consumer unit. A safe level of protein intake is estimated at 50 grams per consumer unit per day (for calculation, see Mboganie 1995, Appendix 5)

Source: Compiled by the authors

For all ingredients consumed during the week under investigation, the source was asked for, i.e. purchased, from own urban farming or from donations by others. The results are shown in table 5. For all groups, purchased food was by far the most important source of energy. Nevertheless, differences between the study groups regarding the proportion of purchased energy and protein consumed could be observed. Energy intake among the Korogocho farmers was 100 kcal per consumer unit per day higher than among the non-farmers despite lower purchases in the farmer group. Since the absolute level of food given to them by others was the same, the conclusion seems justified that this higher energy intake was the result of the Korogocho farmers' own production. The same applied to the intake of proteins. In addition, it was seen earlier that the Korogocho farmers seemed to be better off in material ownership although their monetary income was about the same. This again could be attributed to the fact that if people produce their own food, they spend less income on food and use it for other needs. In other words, for the Korogocho farmers, urban agriculture appears to be beneficial in two ways; directly because of a greater energy and protein intake and indirectly because it enables them to spend less money on food (at least during a given period of the year since the data collected apply to a relatively short period only).

The higher energy (and protein) intake in the USUAP households compared with Korogocho farmers and non-farmers cannot be explained in the same way. The absolute levels of own-produced energy and proteins in the former group were much lower. It appears that the higher energy and protein consumption among the USUAP farmers was mainly caused by the fact that they purchased more food, which is obviously related to their higher welfare level.

**Table 5, Origin of Energy Intake by Study Group (kcal/cu/day)**

	Korogocho farmers (N=)	Korogocho non-farmers (67)	USUAP farmers (62)
• From own urban production	263	–	110
• Given by others	102	96	53
• Purchased	1,539	1,707	1,987
Total	1,904	1,804	2,151

Source: Compiled by the authors.

### Nutritional Condition of Young Children

Anthropometric measurements of children aged between 6 and 60 months—generally considered as the most vulnerable group in terms of nutritional condition—were expressed as weight-for-age (WA), height-for-age (HA) and weight-for-height (WH).<sup>5</sup> The WHO (1983) reference values were used to determine the nutritional status of the children. The HA values of less than 90 percent of the reference value were generally regarded as evidence of stunting while the WH values of <80 percent of reference value were regarded as evidence of wasting. The WA values of <80 percent of reference value were regarded as generally malnourished and those with <60 percent were regarded as severely malnourished. The results are shown in table 6. The average WA, WH and HA in all groups were above the cut-off points. However, there appeared to be a trend similar to that in food consumption. Average WA and WH among the Korogocho non-farmers was lower and average HA among the USUAP farmers was higher.<sup>6</sup>

The differences between the groups are more pronounced when the proportions of malnourished, wasted and stunted children are considered. Using any of these indicators showed that the nutritional status of the children in the non-farming households was the worst and in the USUAP households the best. And although the difference between the proportion of underweight children among Korogocho farmers and among non-farmers was small, the fact that 5 percent of the children among the non-farmers were severely malnourished gives the farmers a better stand. The observed prevalence of malnutrition was within the range found in the earlier mentioned surveys conducted in 1990–1992 in low income areas of the City of Nairobi. The high level of wasting among the Korogocho farmers' children was the same as that found in the low income area of Kawangware in 1992.

Despite these general observations regarding the nutritional condition of the young children in the three study groups, it should be stressed that when looking only at the HA data (i.e. at the long-term nutritional status of the children), the difference between the Korogocho farmers and the Korogocho non-farmers is negligible: average HA is the same, while in both groups the prevalence of stunting is very high. Since the levels of energy intake do not show a big difference either and the levels of income are the same, one

**Table 6, Nutritional Condition of Children Aged 6–60 Months**

	Korogocho farmers (N=)	Korogocho non-farmers (84)	USUAP farmers (30)
<i>Weight-for-age (WA)</i>			
• average*	85.7 (14.5)	83.7 (14.9)	87.0 (11.2)
• % malnourished (WA<80%)	37	42	27
• % severely malnourished (WA<60%)	–	4.8	–
<i>Weight-for-height (WH)</i>			
• average*	96.3 (10.6)	94.0 (11.0)	94.1 (7.8)
• % wasted (WH<80%)	2.9	8.3	–
<i>Height-for-age (HA)</i>			
• average*	92.5 (5.5)	92.6 (7.8)	95.3 (4.9)
• % stunted (HA<90%)	31	38	17

\* Standard deviations in parentheses.

Source: Compiled by the authors.

is inclined to conclude that the advantage the Korogocho farmers have regarding their food supply—in terms of having to buy less food than the Korogocho non-farmers—is not translated into a better long-term nutritional condition, but in a higher material welfare level.

### Conclusion

In general, low income households in the City of Nairobi are unable to adequately feed themselves on their earnings. Hence, many of them try to supplement their food supply by growing subsistence food. However, for many of these households this option is out of reach because of the lack of access to urban land. Unlike the middle and upper income groups (who can very easily feed themselves on their earnings), the low income groups have no backyards. The high densities and overcrowded conditions they live in do not leave them with space to cultivate and/or to keep livestock. They are, therefore, more often found farming vacant public or private land without any form of security. The plots are too small, however, and the farmers may have to move from one plot to another once the rightful owners decide to develop them.

The study indicates that the length of stay in the city plays a role as far as purchasing power and food security of the low income households are concerned. The longer the households have been in the city, the more possibly they establish ways and means of obtaining income and food for survival. For instance, they may acquire formal employment, land to cultivate and may establish reasonable income-generating activities. It is conspicuous that education seems to play no role (anymore) in this since the best-educated group (the non-farmers) was also the group with the lowest percentage of persons in formal employment and with no access to urban land.

Compared with the non-farmers, the Korogocho farming households were somewhat better off in terms of food security and, to a lesser extent, of nutritional status. Their urban farming activities contributed to this in the sense that the self-produced food was mainly meant for home consumption. In addition, it enabled these households to spend less money on food purchases and more on other daily needs, resulting in generally better living conditions than among the non-farmers. In short, in explaining the somewhat higher livelihood level of the Korogocho farmers as compared with the Korogocho non-farmers, urban agriculture certainly plays a role.

The households practising urban agriculture with assistance from USUAP had a higher level of food security and a better nutritional condition than those farming on their own initiative. They appeared to have a more diversified kind of farming and sold more of their produce. However, due to their very small plots their level of food production was quite low. Apart from food production, these households also benefitted from other income-generating activities as well as the shelter improvement project that came along with the urban agriculture project. Hence, their living conditions were better and they had a higher purchasing power compared to the non-farmers and the farmers not involved in any project.

It could be shown, however, that their higher livelihood level was not due to their urban farming practices.

The urban planning policies and laws governing land acquisition in Kenya do not take urban farming into account. Generally, it is not legal to practice urban farming according to the bylaws, although it is tolerated to some extent. However, noting that these urban farmers rely on rainfall, have no technical agricultural and livestock keeping advice and are faced with problems of theft of crops, it appears that there is more potential in terms of food production through urban agriculture than what the results of the present study may suggest. The Government of Kenya policies need to be reconsidered in the light of the hardship to the low income urban households. Because there appears to be great potential in urban agriculture for the purpose of improving food availability and reducing the problem of malnutrition among the poor urban populations, policies of 'allotments' which have been used and succeeded in European countries and Malawi in encouraging urban agriculture could be reviewed and modified for adoption in Kenya. This would assure rights like to agricultural extension services for high yields and advice on what to grow where. Of course there is the issue of safety of the produce for human consumption but this can be controlled by the Government of Kenya taking more control over use of urban waste, environmental management and what land should be used for food production in collaboration with the communities and any other organisations. However, there is need for further research into the quality and improvement of urban food and livestock production.

### Notes

- <sup>1</sup> The items used were radio, sofa set and bicycle. Households received a score of 1 for the ownership of any of these items and a score of zero for not owning the item. The scores were summed up so that the lowest score was zero and the highest score was 3. The distribution of the households is shown in Mboganie (1995:72). Households scoring below 2 were considered to have a low welfare index and to be 'very poor'.
- <sup>2</sup> One consumer unit (cu) is the consumption equivalent (here: in terms of required energy) of a nominal adult male. The required energy of all household members is derived from this and depends on such factors as age, sex, physiological status and physical activity level (see Mboganie, 1995: Appendix 2). Data on all foods consumed, harvested, purchased and received as gifts were translated into kilograms of edible portions and into kilocalories and grams of protein per consumer unit, using *Food Composition Tables for Foods Commonly Eaten in East Africa*. (Nairobi: Clive E. West, 1987) Technical Centre for Agriculture and Rural Development and Food and Nutrition Cooperation Programme of East, Central and Southern Africa (1987).
- <sup>3</sup> To ensure that the results were not influenced by income outliers, two additional analyses of energy and protein intake, as well as nutritional condition (see below) were done; one by using only the households with a monthly income of less than Ksh. 2,500 and one with only the households with a low welfare index (for details, see Mboganie 1995: Appendix 4). In both cases, the results showed the same trends. Hence, the original results are presented here.

- 4 It has been shown that there is a negative relationship between household size and energy intake per consumer unit, i.e. the larger the household the lower the energy intake (see e.g. Niemeijer, Foeken and Klaver, 1991:35–36). If the figures in table 4 would be corrected for household size, however, the major result would be that the energy intake in the non-farmers households would be even lower.
- 5 *Height-for-age* (HA) expresses the height of a child as a percentage of the corresponding median height of children of the same age in the reference population. The HA values of less than 90 percent are generally regarded as evidence of stunting, indicating that the child has failed to grow satisfactorily during lengthy periods in the past. Therefore, HA is commonly regarded as an indicator of nutritional history reflecting social and economic conditions. *Weight-for-height* (WH) expresses the weight of a child as a percentage of the corresponding median weight of children of the similar height in the reference population. The *Weight-for-height* (WH) values of below 80/85 percent can be regarded as evidence of wasting, indicating acute malnutrition. In this report, value of 80 percent is used. *Weight-for-height* (WH) is an indicator of present nutritional status. The weight of a child can also be expressed in terms of *Weight-for-age* (WA), often used as a 'short-cut measure' because it reflects both previous growth and present nutritional condition. It is used for a broad classification of malnutrition. Children with less than 60 percent of the reference weight for their age are generally regarded as severely malnourished while those with a WA between 60 percent and 80 percent as malnourished.
- 6 Usually the averages are influenced by the age distribution of the children. Children aged 1–2 years usually tend to have a poor nutritional status compared to the rest due to the effect of weaning. For purposes of verification, the results were corrected for age distribution in each group but the trend was even more magnified. The original results are therefore presented.

## References

- Alarcon, J.A. and J. Rivera (1994). "The Impact of Changes in Purchasing Power on Food Consumption on an Urban Population in Guatemala City", *Ecology of Food and Nutrition* Vol. 31 Nos. 3–4.
- Atuanya, E.I. (1987). "Nutrition as an Indicator of Urban Poverty, A Dietary Survey of the Urban Poor in Benin City, Nigeria", in P.K. Mwakinwa and A.O. Ozo (eds) *The Urban Poor in Nigeria*. Ibadan: Evans Brothers (Nigeria Publishers) Limited.
- Dennery, R.P. (1995). *Inside Urban Agriculture: An Exploration of Food Producer Decision Making in a Nairobi Low Income*. Wageningen: Unpublished Thesis. Agricultural University.
- Drakakis-Smith, D. (1992). "Strategies for Meeting Basic Food Needs in Harare", in J. Baker and P. O. Pedersen (eds) *The Rural-Urban Interface in Africa: Expansion and Adaptation*. Copenhagen: Seminar Proceedings No. 27. The Scandinavian Institute of African Studies and Centre for Development Research.
- Foeken, D. and N. Tellegen (1992). *Household Resources and Nutrition of Farm Labourers in Trans Nzoia District, Kenya*. Nairobi / Leiden: Food & Nutrition Studies Programme, Report No. 44. Ministry of Planning and National Development / African Studies Centre.
- Freeman, D. (1991). *A City of Farmers: Informal Agriculture in the Open Spaces of Nairobi, Kenya*. Toronto: McGill University Press.
- Gathuru, P.K. (1988). *Urban Agriculture Project: Hopes and Challenges*. Paper Presented at Workshop on "Food for the Future" held in Eldoret, Kenya.
- Hoorweg, J. et al. (1991). *Economic and Nutritional Conditions at Settlement Schemes in Coast Province*. Nairobi/Leiden: Food & Nutrition Studies Programme, Report No. 36. Ministry of Planning and National Development/African Studies Centre.
- Kenya, Republic of (1991). *Fourth Rural Child Nutrition Survey 1987*. Nairobi: Ministry of Planning and National Development, Central Bureau of Statistics.
- Kenya, Government of, and UNICEF (1990). *Metropolitan Household Survey, 1989*. Nairobi: Government Printer.
- Kenya, Government of, and UNICEF (1992). *Children and Women in Kenya: A Situation Analysis 1992*. Nairobi: Government Printer.
- Lado, C. (1990). "Informal Urban Agriculture in Nairobi, Kenya: Problem or Resource in Development and Land Use Planning?" *Land Use Policy* (July).
- Lee-Smith, D. et al. (1987). *Urban Food Production and the Cooking Fuel Situation in Urban Kenya*. Nairobi: Mazingira Institute.
- Matrix Development Consultants (1993). *Nairobi's Informal Settlements*. An Inventory Report PN-ABH-741 prepared for USAID/REDSO/ESA.
- Maxwell, D.G. and S. Zziwa (1992a). "Urban Agriculture in Kampala: Indigenous Adaptive Response to the Economic Crisis", *Ecology of Food and Nutrition* Vol. 29 No. 2.
- Maxwell, D. and S. Zziwa (1992b). *Urban Farming in Africa: The Case of Kampala, Uganda*. Nairobi: ACTS Press.
- Mboganie Mwangi, A. (1995). *The Role of Urban Agriculture for Food Security in Low Income Areas in Nairobi*. Nairobi/Leiden: Food and Nutrition Studies Programme, Report No. 54. Ministry of Planning and National Development/African Studies Centre.
- Memon, P.A. and D. Lee-Smith (1993). "Urban Agriculture in Kenya". *Canadian Journal of African Studies* Vol. 27 No. 1.

- Mlozi M.R.S. et al. (1992). "Urban Agriculture as a Survival Strategy in Tanzania", in J. Baker and P.O Pedersen (eds) *The Rural-Urban Interface in Africa: Expansion and Adaptation*. Copenhagen: Seminar Proceedings No. 27. The Scandinavian Institute of African Studies and Centre for Development Research.
- Mutisya, D.N. and C. Lado (1991). "Some Socioeconomic Factors Behind Roadside Farming in Kiambu District, Kenya", *Journal of Eastern African Research and Development* Vol. 21.
- Niemeijer, R.D. et al. (1991). *Seasonality in the Coastal Lowlands of Kenya, Part 4/5: Food Consumption and Anthropometry*. Nairobi/Leiden: Food & Nutrition Studies Programme, Report No. 38. Ministry of Planning and National Development/African Studies Centre.
- Rakodi, C. (1985). "Self-Reliance or Survival? Food Production in African Cities, with Particular Reference to Zambia", *African Urban Studies* Vol. 21.
- Rakodi, C. (1988). "Urban Agriculture: Research Question and the Zambian Evidence", *Journal of Modern African Studies* Vol. 26.
- Sachs, I. and D. Silk (1990). *Food and Energy: Strategies of Sustainable Development*. Tokyo: United Nations University Press.
- Sanyal, B. (1987). *Urban Cultivation in East Africa: People's Response to Urban Poverty*. Cambridge: Massachusetts Institute of Technology.
- Sawio, C.J. (1993). "Urban Agriculture: Eastern and Central Africa", in L.J.A. Mougeot and D. Massé (eds) *Urban Environment Management; Developing a Global Research Agenda*, Vol. 1. Ottawa: International Development Research Centre.
- Wade, I. (1987). "Community Food Production in Cities of Developing Nations", *Food and Nutrition Bulletin* Vol. 9 No. 2.
- West, E.C. (1987). *Food Composition Table for Energy and Eight Nutrients in Foods Commonly Eaten in East Africa*. Nairobi: Technical Centre for Agriculture and Rural Development and Food and Nutrition Cooperation Programme of East, Central and Southern Africa.
- WHO (1983). *Measuring Change in Nutritional Status: Guidelines for Assessing the Nutritional Impact of Supplementary Feeding Programmes for Vulnerable Groups*. Geneva: World Health Organisation.
- World Vision International (1990). *Field Experience from Korogocho Project*. Nairobi: Unpublished Report.
- Yeung, Y. (1987). "Examples of Urban Agriculture in Asia", *Food and Nutrition Bulletin* Vol. 9 No. 2.

**OXFORD'S NEW JOURNAL FOR THE SOCIAL PROFESSIONS**

## European Journal of Social Work

Welfare, Social Services and Social Action

**EDITORS:**

Prof. Hans-Uwe Otto, University of Bielefeld, Germany  
Prof. Walter Lorenz, University College, Cork, Ireland

A social work journal is being launched in 1998 by Oxford University Press that will provide a new forum for academic debate in the social professions. It will analyse and promote European and international developments in social policy, social service institutions and strategies of social change by publishing refereed papers on contemporary key issues.

**Articles in Volume 1, Issue 1 will include:-**

- The Politics of Care for the Elderly in Scandinavia, *Gunborg Jacobsson, Finland*  
Issues in European Child Protection Research, *Rachel Hetherington, UK*  
From Service to Social Control: Implications of Welfare Reform for Professional Practice in the US, *Neil Gilbert, Berkeley, USA*  
The Flight from Universalism. The Case of Swedish Social Policy, *Staffan Blomberg, Lars Harrison, Jan Magnusson, Jan Peterson, Sune Sunesson, Lund, Sweden*  
The Professional Role of Social Work in the Market, *Geert van der Laan, Utrecht, The Netherlands*  
Between Interest in Practice and Power of Definition. On the Development of Social Work in Spain, *Andreu López-Blasco, Spain*

### **CALL FOR PAPERS**

Manuscripts should be submitted in triplicate, or preferably on disk, to:  
Prof. Hans-Uwe Otto, Fakultät für Pädagogik, Universität Bielefeld, Postfach 100131,  
D-33501 Bielefeld, Germany. Tel: 0049 521 1063309, Fax: 0049 521 1066028  
E-mail: EJSW@POST.Uni-Bielefeld.de

### **INTRODUCTORY OFFER OPEN UNTIL 1 DECEMBER 1997!**

Volume 1 1998 (3 issues) ISSN: 1369-1457

**Personal subscribers: Order before 1 December 1997 and save £10/US\$17!**

Institutions:  £80/US\$150 Individuals:  £30/US\$50 \*Students:  £20/US\$33

Individuals:  £20/US\$33 (if order received by 1 December 1997)

£ sterling rates apply in Europe, US\$ rates elsewhere \*Please send proof of student ID

I wish to subscribe to *European Journal of Social Work* as indicated above.

I would like to order a sample copy of Issue 1 which will be available in early 1998

Name \_\_\_\_\_ Address \_\_\_\_\_

Post code/Zip \_\_\_\_\_ Country \_\_\_\_\_

Please return to: journals Marketing (EJSW3), Oxford University Press,  
Great Clarendon Street, Oxford OX2 6DP, UK  
Tel: +44 (0) 1865 267907, Fax: +44 (0) 1865 267485 E-mail: jnlorders@oup.co.uk

## URBAN AGRICULTURE IN AFRICA: A COMPARATIVE ANALYSIS OF FINDINGS FROM ZIMBABWE, KENYA AND ZAMBIA

Daniel S. Tevera

Department of Geography, University of Zimbabwe, PO Box MP 167, Mount Pleasant, Harare, Zimbabwe  
Tel: 263-4-303-211; Fax: 263-4-353-407

### Abstract

Accepted May, 1996

*With rapid urban growth rates, a diminishing ability of many countries to feed the increasing national populations, persistent droughts and escalating food prices, urban agriculture is increasingly becoming a food security strategy both at the national and household levels. According to Freeman (1993:1) urban agricultural activities in Third World urban centres "have reached the point where their importance as a part of the urban informal sector can no longer be overlooked." The extent, nature and role of urban agriculture in Africa vary considerably within and between countries as well as throughout the urban hierarchy. The main sources of urban food are the urban house-gardens (on-plot cultivation) and the stretches of open land (off-plot cultivation) within residential and industrial areas and the peripheral areas where 'illegal' cultivation is quite common. However, the physical growth of most urban centres has curtailed the amount of land available for subsistence food production. Given the low and erratic incomes of many urban families in Africa, numerous households are confronted with severe nutritional problems that are frequently exacerbated by distribution and marketing system inefficiencies. It is against this background that urban agriculture should be considered if realistic solutions are to be found. Urban agriculture refers to the cultivation of crops at both the subsistence and commercial levels and keeping of small livestock in open spaces in urban areas. However, due to the research interests of academics and donor agencies the term is commonly used to refer to off-plot cultivation which is largely considered 'illegal'. Although much activity occurs within house-gardens (where they exist) urban agriculture has been fostered by the availability of unused open spaces (Moshia, 1991 and Maxwell and Zziwa, 1992) and it utilises resources in urban ecosystems which would otherwise be unutilised (Smit and Nasr, 1992: 141–152). Urban agriculture is a significant urban activity that relates to other processes in the urban centre, such as the use of waste water to irrigate crops. Links exist between urban agriculture activities, household consumption, petty-trade and formal recycling in the form of flows of waste material (e.g. the use of sewage effluent for cattle pastures on municipal farms in the City of Harare in Zimbabwe helps the city council earn several millions of Zimbabwe Dollars annually through cattle sales. Food is the most crucial item in the expenditure budget of the households. On the average, 50–60 percent of the total household income is spent on food in Third World countries. Sanyal (1986 and 1987: 197–207), for instance, has indicated that poor households in Tanzanian urban centres produce about one-third of nutritional needs in this manner while in Kenya, Lamba (1993: 83–97) has observed that more than 50 percent of the urban households' expenditure is spent on food. In Zimbabwe, official surveys show that low-income urban households spend over half of their budgets on food items alone while the high-income urban households spend only 20 percent of their budget on food. The need to supplement inadequate urban diets compels a substantial segment of urban dwellers to engage in urban agriculture. However, Drakakis-Smith (1992: 258–283) noted that there is need to differentiate between urban food production for self-consumption and food produced for sale. The purpose of this paper is to examine the importance of urban agriculture in Africa by analysing the major findings of the major empirical studies on urban agriculture in Africa, with special reference to Zimbabwe, Kenya and Zambia. The three African countries are very different with respect to the degree of urbanisation and the extent of urban agriculture. However, these countries share a broadly similar settler colonial heritage, space-economy and physical planning traditions which have always regulated urban land use. In all the three countries, towns are planned and local authorities have a wide range of powers to control and shape the built environment.*

### Résumé

*La culture d'espaces libres ou clairières non-construites dans la trame urbaine retient de plus en plus l'attention du public en Afrique. Dans un premier temps, l'auteur note que la résurgence récente de l'agriculture urbaine et ses interrelations avec d'autres phénomènes urbaines restent négligées par les chercheurs africains, comparativement à l'étude d'autres questions. La littérature disponible sur le sujet a néanmoins quantifié l'ampleur et la répartition spatiales des activités agricoles, tracé le rofil socioéconomique des producteurs et l'apport économique de leur production à l'économie urbaine; elle en a examiné les aspects opérationnels et à moindre titre, ses effets environnementaux sur la ville et son hinterland. Dans une seconde partie, une lecture comparée des principales études réalisées au Zimbabwe, au Kenya et en Zambie porte l'auteur aux conclusions suivantes: l'agriculture urbaine dans ces pays n'est définitivement pas transitoire mais croissante, laquelle donne lieu à des formes urbaines qui s'éloignent des idéaux occidentaux; les plus pauvres bénéficient peu de l'activité; en général celle-ci est encore peu endossée par les autorités locales. Toutefois, l'auteur signale une tendance récente vers des positions officielles plus condescendantes, l'incorporation de l'activité à l'aménagement de nouveaux centres urbains et le relâchement des contrôles dans les villes existentes.*

### Studies on Urban Agriculture in Africa

It is the contention of this paper that urban agriculture is a phenomenon in Africa which has largely escaped the attention of urban geographers and academic researchers in general. Clusters of research exist on urban agriculture in Africa and its spatial dimensions but the available literature is rather limited and it covers only patches of an interrelated network of social, economic and political phenomena. Thus as Drakakis-Smith (1992: 258–283) has observed there has been less written about urban food supply systems than other basic needs such as shelter, despite the fact that food is the most basic of needs and that shortages are more likely to trigger urban instability than inadequate provision of housing or education.

The existing literature on urban agriculture in Africa falls under four basic and sometimes overlapping approaches. First, a relatively large number of studies have focused on the identification of the spatial extent and location of agricultural activities in urban areas (such as Mazambani, 1982a and 1982b: 134–138; Lado, 1990; Mbiba, 1995). These studies have been largely of baseline nature, characterised by extensive descriptions, outlining the incidence of urban agriculture, and informing policymakers of the positive features of urban agriculture.

A second group of studies focuses on the socioeconomic profiles of the urban cultivators and the economic importance of urban agriculture (such as Mazingira Institute, 1985; Rakodi, 1985: 53–63, 1988a: 495–515, 1988b; Sanyal, 1986, 1987; Freeman, 1991, 1993). These studies have addressed issues such as the spatial distribution, the activities and motives of the cultivators, the financial and economic value of urban agriculture and its implications on self-sufficiency at the household level. Also, they have highlighted the importance of urban agriculture as a socioeconomic survival and livelihood-enhancing strategy for the urban poor. The study by Freeman (1993) focused on the significance of urban agriculture for the advancement of women in African urban centres. He made the observation that female cultivators encountered tremendous impediments which limited their advancement in the urban areas.

A third group of studies such as the ones by Sanyal, 1986; Lado, 1990: 257–266; Mosha, 1991: 83–92; Maxwell and Zziwa, 1992; Drakakis-Smith et al., 1995: 183–193; has explored the operational dimensions of urban agriculture within the context of urban economies characterised by several competing land uses and intertwining linkages. However, the rural-urban linkages (e.g. rural-urban food flows, etc.) and how they influence urban economic activity, especially urban agriculture, have not been properly contextualised. As Wekwete (1993: 98–110) has observed, there is need to contextualise the phenomenon of urban agriculture within the broad context of the urban economy and urban management and to plan for the activity by making it one of the main urban land-use activities. This needs to be seriously considered given the fact that within African urban centres there are lots of unutilised open spaces. Also, there is need to examine the linkages between urban agriculture, waste management and health. Comprehensive studies are required on the suggested links between urban agriculture

and the diffusion of vector-borne diseases such as malaria. Similarly, there is need for research on the interface between urban agriculture, pollution and the degradation of the urban environment. Also, Mougeot (1994: 1) has lamented the lack of “longitudinal and comparative analyses between farming and nonfarming households, on nutritional status of the urban poor and their strategies for coping with food insecurity, as well as the current and potential impact of urban agriculture on households and their members more exposed to malnutrition risks (women, children, and the elderly).”

A final group of studies such as by Mazambani, 1982a: 134–138; Maxwell and Zziwa, 1992 and ENDA-Zimbabwe, 1994 has been concerned with the environmental effects of urban agriculture in urban centres and their inlands. Watts and Bransby-Williams 1978: 101–102 made some preliminary observations on the link between urban agriculture and malaria.

Unfortunately, none of the empirical analyses on urban agriculture in Africa, excluding Rogerson's (1992: 229–234) most illuminating conceptual analyses, has tried to examine the phenomenon across national boundaries. There is need for cross-country studies on urban agriculture to better conceptualise the phenomenon and to make better informed policy recommendations. Also, there is need for research and policy dialogue on the potential contribution of urban agriculture to poverty alleviation and sustainable resource utilisation in African urban areas.

### Survey of the Empirical Studies

In this section some of the empirical surveys on urban agriculture conducted in Zimbabwe, Kenya and Zambia will be reviewed. Several factors explain why these three countries were selected for this study. First, because these countries have experienced a massive growth in the scale of the activity during the past decade despite the existence of limiting policies and regulations. Second, because extensive research has been undertaken on urban agriculture over at least ten years and there is ample data for analysis for comparable times. Third, in many ways the urban cultivation practices and spatial patterns mirror those prevailing elsewhere in the East and Southern Africa region, although the scale seems to be too high. This suggests that in the near future the prevailing urban agriculture situation in these countries is likely to be repeated elsewhere in the region hence there is need for the other countries to learn from the urban agriculture experiences of Zimbabwe, Kenya and Zambia.

### Zimbabwe

Zimbabwe has a population of 10.4 million and 36 percent of which are accommodated in urban areas which have been growing at a rapid rate of about 5.4 percent per annum between 1982 and 1992. Urban poverty is widely acknowledged and authorities conservatively estimate that between 10–15 percent of the urban population live in absolute poverty in squatter settlements (on vacant public land) and backyard shelter (in the high-density suburbs). Urban poverty has been exacerbated by lack of employment generation in the formal sector during the past 10 years. In 1992 over 1.3 million people were formally considered to be

without jobs and the rate of unemployment officially estimated at 25 percent.

Several factors have contributed to the rise of urban agriculture in the country. First, persistent droughts since 1982 which have reduced food flows from the rural to urban areas and in some cases there have been reverse flows. In Harare, the capital, at least a quarter of the low-income households receive food from their family homes in the rural areas. Second, the international recession of the mid-1980s (coupled by the drought) has been blamed for the low rate of economic and employment growth and many families have been compelled to boost their household incomes by cultivating vegetables for the market. Third, the implementation of a structural adjustment programme in 1991 has resulted in heavy social costs as, among other things, prices have risen following the removal of food and fuel subsidies and as many workers have been retrenched. The progressive removal of subsidies and deregulation of prices of basic commodities like foodstuffs have been inflationary. During the 1991 and 1992 period food prices for lower-income urban households rose by an incredible 534 percent. The price of subsidised plain maize meal rose by over 100 percent between January 1991 and January 1994 while the price of bread rose by between 100–175 percent during the same period (Tevera, 1995: 79–80). Within the urban areas, however, the high food prices have forced more households to produce their own food.

In Zimbabwe four studies on urban agriculture and urban food supplies are worth noting. The pioneering study on urban cultivation and woodfuel collection in Harare by Mazambani (1982a and 1982b: 134–138) examined the activity in the city from the perspective that it was transforming an urban environment into a rural landscape. Central to this study were three important observations. First, that agriculture within urban and peri-urban areas is a widespread activity and in most cases is for subsistence purposes and involves limited capital inputs. In Harare, urban agriculture is extensive in private gardens (especially in the high-income/low-density areas) and in public open spaces such as undeveloped industrial and residential areas and road or railway reserves. Second, on the basis of analyses of aerial photographs Mazambani (1982b: 134–138) established that the cultivation of open-spaces in Harare had increased from about 267 hectares to 4,762 hectares between 1955 and 1980 and that the cultivation was mostly occurring in *vleis* (wetlands). Third, that cultivation was mainly for subsistence purposes and that maize, sweet potatoes and vegetables were the most popular crops cultivated.

Research on urban food systems and urban agriculture in Harare, conducted by several teams of geographers between 1990 and 1994, has generated a number of scholarly publications (Drakakis-Smith and Kivell, 1990: 156–180; Drakakis-Smith and Tevera, 1993; Drakakis-Smith, Bowyer-Bower and Tevera, 1995: 183–193). The 1989 survey by Drakakis-Smith and Kivell investigated the nature and origin of food production activities within Harare and its periphery. A follow-up survey by Drakakis-Smith and Tevera investigated the basic characteristics of the urban food distribution system and its links with the urban household.

More recently, a survey by Drakakis-Smith, Bowyer-Bower and Tevera (1995) examined the linkages between urban poverty and the increasing incidence of urban agriculture in Harare.

The above group of studies produced a number of interesting findings. First, that 80 percent of all house-gardens in Harare are used to produce food mainly for subsistence (Drakakis-Smith and Kivell, 1990: 156–180) and that household members who engaged in urban food production undertook several other roles in relation both to production and reproduction. Second, that in three highly differentiated residential suburbs of Harare (i.e. Glen View high density area, Mabelreign medium density area and Epworth, which is an upgraded former squatter settlement, about 80 percent of the interviewees grew crops in their home-gardens primarily for household consumption (Drakakis-Smith and Kivell, 1990: 156–180). The study noted that in Epworth there was a greater tendency for families to keep small livestock such as chickens and goats than in the other residential suburbs. There is ample documentation of the various foods farmers grow and the animals they rear where they live in the urban and peri-urban areas.

Third, that undernutrition characterises the lives of the low-income households in Harare despite the fact that most spend over half of their income on food (Drakakis-Smith and Tevera, 1993). Fourth, that extensive illegal cultivation regularly covers public open spaces during the rain season from November to March and that open spaces close to the residential areas were extensively cultivated. Off-plot cultivation is generally considered to be illegal by the authorities if it either occurs within 30 metres from water-courses or is undertaken without written approval of the authorities. Fifth, that virtually all urban food production outside house-gardens is considered illegal (with the exception of the fields that are cultivated by cooperatives with the city-fathers' blessing) and attracts a generally negative response from the authorities. Sixth, that urban farmers receive minimum support, if any, from central government or the local authority. Generally, there are no urban extension services for crop production and livestock rearing. Similarly, credit facilities for urban farming are almost non-existent hence the current low investment in urban agriculture. Seventh, that the findings reaffirmed Mazambani's (1982a) results that maize, sweet potatoes and beans were the leading crops cultivated. Eighth, that urban agriculture was not confined to the poor, but that there was incredible heterogeneity among the cultivators. A fairly large number of middle-income households are involved and these often have better access to land, labour and finance. The group included many of the urban poor but not the poorest of the urban poor because the latter lacked security of tenure in the city and had very limited access to land. Finally, that conflicts existed between the urban poor and the authorities because of the latter's strict implementation of policies restricting the cultivation of municipal land (Drakakis-Smith, Bowyer-Bower and Tevera, 1995). However, it was noted that more recently officials had been more accommodative of urban agriculture as was reflected by the general moratorium on maize slashing since the 1992–1993 season.

The research by Mbiba (1994: 188–202 and 1995: 75–86) who classified urban agriculture by type of product (arable or non-arable) by spaces used (on-plot or off-plot) and by institutional settings (legal or illegal), addressed the issue of the role of urban agriculture in Harare and the legislative and policy issues. The study involved the use of structured questionnaires to interview 1,200 households and data were collected on the number of cultivators, types of crops grown and amount of space utilised. The following findings emerged from the study. First, that the bulk of urban agriculture in Harare was arable and livestock rearing was not as extensive as elsewhere in Africa. Second, that the most common crops cultivated on off-plot fields were maize, beans, pumpkins, sweet potatoes and that fertilisers were routinely applied. Third, that the size of the plots varied from 400 to 9,000 square metres and that, on the average, the cultivators had cultivated the same plots for about 3.6 years. Fourth, that 95 percent of the cultivators lived within a radius of 5 kilometres from their off-plot field and that 63 percent of the cultivators were women. Finally, that 88 percent of the cultivators tended their plots while 12 percent employed contract labourers to work on the fields. The last finding clearly suggests that some of the households involved in off-plot cultivation in the city are not low-income families and that they probably grow crops mainly for the market.

The study by ENDA-Zimbabwe (1994) involving a sample of over 1,700 cultivators, examined several aspects of urban agriculture in Harare. Central to this work were several major observations. First, that the area under cultivation had increased by 92.6 percent between 1990 and 1994 and that the spatial area under cultivation in the city had increased from 8.8 percent to 16.7 percent during the same period. A related finding was that most of the increase had occurred in the high density areas. Second, that urban agriculture is pursued by homeowners (61 percent of the total), lodgers (tenants) (27 percent), servants (4.5 percent) and relatives of homeowners (7.4 percent). However, about 90 percent of the urban cultivators stayed in the high density areas while 7.5 percent and 2.8 percent stayed in the low density and medium density areas respectively. Third, that 62 percent of the urban cultivators were unemployed and were mostly women. Fourth, that maize was cultivated on 50 percent of the area under cultivation, followed by sweet potatoes and groundnuts which took 19 percent and 8 percent of the space respectively. Fifth, that 88.4 percent of the cultivators engaged in off-plot cultivation and used chemical fertilisers.

### Kenya

In the Kenyan context, two studies focusing on on-plot and off-plot cultivation, respectively, are worth noting. The study by the Mazingira Institute (1985) is perhaps the first comprehensive study on urban agriculture in Kenya. The study was undertaken in 1985 and it covered six urban areas from which a sample of 1,576 predominantly on-plot cultivators was randomly drawn.

Central to this work were at least four major observations. First, that urban agriculture in Kenya was quite diverse and it included the production of vegetables, fruits, grains,

bananas, flowers and the raising of poultry, pigs, goats and cattle. Second, that only 31 percent of the farmers had legal access to the urban land that they cultivated and that the low-income households tended to cultivate municipal land which was in transitional use or in peripheral areas where there was little crop security (Mazingira Institute, 1985). Third, that a significant portion of the poorest households in Nairobi spend in excess of their total income on food through borrowing. Fourth, that agricultural practices are very basic and dependent on hand labour with only a few simple and inexpensive tools and there is extensive use of organic inputs in Nairobi and technical advice and agricultural extension services are lacking. Fifth, that 62 percent of the households surveyed were engaged in urban cultivation mainly for their subsistence needs and that 56 percent of the urban farmers were women. Sixth, that as many as 17 percent of the households kept livestock, especially poultry and cattle, within the city. Seventh, that 63 percent were involved in out-of-town agricultural activities mainly because of lack of access to suitable land close to their residential areas. Eighth, that about 25.2 million kilogrammes of crops, worth about US \$ 4 million were produced in the country's urban areas in a single season.

The major recommendation that emerged from the Mazingira Institute study was that there was need to support local authorities, NGOs and Community-Based Organisations (CBS) in devising creative and flexible solutions for improving access to land.

The Mazingira Institute study is the first large-scale study on urban agriculture conducted in Kenya and it did shed some light on the complex phenomenon. It also paved the way forward for several studies using similar but more rigorous research methodologies.

A similar picture of the findings emerged from Freeman's (1991) study of 618 urban cultivators that were mainly engaged in off-plot cultivation in Nairobi (Freeman, 1991). The study observed that urban agriculture, mainly dominated by women who had been in the city for long periods, was widespread throughout the city. The results show that 28 percent of the urban farmers had primary education while 6 percent had secondary education. It is evident from the study that most of the urban farmers held urban jobs and that their involvement in farming activities reflected a multiple livelihood strategy intended to supplement the low wage incomes. Freeman (1991) classified the urban cultivators into four categories: backyard farmers who cultivated private residential land; riverside farmers who cultivated land on river flood plains; farmers who cultivated on roadside verges and squatter farmers who cultivated open spaces in industrial and residential areas, land bordering the railway tracks and parkland.

The study observed that urban farming in Nairobi was constrained by environmental factors (such as drought, land degradation, flooding), crop loss due to pests and by zoning laws which limited access to land. It also stressed the need to plan for urban agriculture because it had the potential to contribute substantially to food security in the cities in Kenya.

Freeman's study on off-plot urban cultivation complemented the earlier on-plot survey undertaken by the

Mazingira Institute. However, it is interesting to note that in both cases the studies observed that cultivation was predominantly for subsistence purposes and that, despite the accommodating position assumed by the various local authorities in Kenya, urban agriculture was regarded with lack of sympathy and this explains the general lack of support to urban cultivators, for example in the form of extension services and loans for inputs.

More recently, Lamba (1993:83–97) observed that proper urban agriculture can help reduce water, waste and hazard problems and increase returns on water bodies in the large towns of Kenya. He also noted that cultivation on home-gardens provided a possibility to reuse domestic water and to recycle urban wastes into production inputs.

### Zambia

In Zambia two independent studies by Sanyal and Rakodi documented a variety of agricultural activities in the city. Sanyal (1986 and 1987: 197–207) surveyed 250 low-income households in Lusaka, the capital, and observed that 60 percent of the households cultivated food in either their gardens or in open spaces in the urban periphery. Central to this study were two important observations. First, that subsistence food amounted to one-third of all the food consumed by the low-income households in Lusaka. Second, that recent migrants tended to have less access to land for cultivation and subsistence food than longer term residents.

A series of studies conducted by Rakodi in Lusaka between 1970 and 1980 confirm the extensive nature of urban agriculture in the city. Rakodi (1988b) reports that the surveys showed several things. First, that over 50 percent of the people interviewed practised on-plot and off-plot cultivation. Second, that urban cultivation in the city was a key survival niche particularly for low-income women with limited formal education and few marketable skills (Rakodi, 1988a: 495–515 and 1988b). Third, that the choice of crops grown tended to be influenced by the market, the local by-laws, susceptibility to theft, labour and water needs. For instance, Rakodi (1988a: 495–515) observed that the tendency to grow cabbages, onions and tomatoes in the home gardens was determined by the need to water the crops regularly and to protect them against theft. Fourth, that households engaged in urban agriculture because of household need (i.e. need for extra food or money) and supply factors (e.g. the availability of land for cultivation, labour, time, inputs).

### Discussion of Findings and Policy Responses

What lessons can we draw from the urban agriculture experiences of Zimbabwe, Kenya and Zambia? Having identified the particular features of urban agriculture in these three countries, one could draw at least four lessons. First, there is considerable evidence that urban agriculture is not a transient activity in Africa as food continues to be produced within the urban centres. Instead, the facts show that it continues to increase in spatial terms and has become quite extensive in scale. Consequently, urban forms have emerged in Africa that are significantly at variance with the 'ideal' western concepts of urban development. As Freeman (1993:19) has observed there is "an accelerating divergence

of urban development away from the colonial ideal of the showcase capital, and from the notion that cities comprise the exclusive domain of the governing and business elites."

Second, the real poor do not seem to benefit much from urban agriculture because their access to land is too circumscribed and where they have access they often cultivate tiny fields that are incapable of producing yields huge enough to economically emancipate them. Third, this strategy is not confined to the poor, but includes most middle-income households who often have better access to land, labour and finance.

Fourth, it is an economic activity which in the majority of cases does not have the support nor sympathy of local authorities in Africa and has either been ignored or penalised by policymakers "partly because of the mistaken assumptions that the cultivation of maize is a health hazard" (Rakodi, 1985: 57). Rakodi (1985: 56–63 and 1988a: 495–515) also observed that urban planning, both in the central and peripheral areas of several Zambian urban centres had not made an attempt to accommodate urban agricultural activities. Official responses to urban cultivation vary from country to country and from urban centre to urban centre but have tended to be proscriptive since the activity is perceived as a hindrance to the development of the urban areas envisaged by planners and urban administrators. Indeed some authorities have gone so far as to legislate against urban food production (Drakakis-Smith, Bowyer-Bower and Tevera, 1995: 183–193). In Kenya, for example, it is illegal to keep livestock or cultivate crops within urban areas (Mazingira Institute, 1985). In addition to being considered illegal those involved in off-plot urban agriculture are subject to sporadic harassment by urban authorities in Kenya and Zimbabwe (e.g., the burning or slashing of crops and prosecution of cultivators).

In Zambia urban agriculture appears to be tolerated by the authorities (Rakodi, 1988a: 495–515 and 1988b), while in Tanzania and Malawi it is only tolerated in new urban centres which take cognisance of this activity in urban planning (Mosha, 1991: 83–92). Elsewhere it has never been formalised and can, therefore, not expect official support services. For the 'illegal' urban cultivators life is a perpetual struggle mainly because they have to prevail against a barrage of 'complex regulations' blocking their efforts to survive. The prevailing repressive attitudes towards urban agriculture seem to suggest that urban administrators and planners are not aware of the importance of urban agriculture.

There has been a shift in official thinking from intolerance before the 1990s to some tolerance, albeit punctuated by interludes of harassment by the authorities. However, there has been a change in the official attitude of government towards most informal sector activities including urban agriculture. The worsening economic situation forced officials in Lusaka to pay a blind eye to urban agriculture since the mid-1980s (Sanyal, 1986 and 1987: 197–207). Similarly, Mbiba (1994: 188–202) has observed that authorities in Harare have relaxed the controls on off-plot cultivation since the devastating drought of 1991–1992 and the introduction of the structural adjustment programme in 1991. Nevertheless, in the three countries urban cultivation is still looked upon as a rural activity which has no place in the

urban areas. While local authorities may be tolerant of urban agricultural activities, legal paraphernalia inherited from the colonial era need to be changed as they are still hostile to urban agriculture.

Several major recommendations emerged from the studies highlighted above. First, it seems reasonable to permit even encourage, the urban poor to grow more food on urban land but under controlled conditions in order to avert the degradation of the urban environment. Most African governments would improve their ability to deal with problems such as widespread urban poverty by employing the right policies and programmes, especially those that provide an enabling environment for the poor. Perhaps there is need for local authorities in these three countries to take the lead from Maseru in Lesotho, where the local authority has taken an enabling approach to urban agriculture by not only accommodating it but by supporting it. This could be achieved by allowing the cultivators to use open spaces on a temporary basis until it is ready for development instead of letting the land stay idle or destroying crops. Relaxation of municipal regulations constraining urban agriculture will lead to a growth of the activity and will help provide a cushion for the urban poor.

### Conclusion

The studies that were reviewed on urban agriculture in Zimbabwe, Kenya and Zambia focused on the importance of the activity as a survival strategy of the urban poor and to a lesser extent addressed the issues of land-use planning. There is need, however, for new studies that address issues not covered in great depth by the earlier studies, such as the discussion of the economic benefits and costs of urban agriculture to the national economies and the contribution of the activity to the achievement of sustainable urban development, with respect to resources and ecology.

In summary, urban agriculture is common in most urban centres in Africa but differences exist in terms of the magnitude and the institutional responses which range from being prohibitive to being accommodative. Policies pursued in Zimbabwe, Kenya and Zambia, generally, seem to fall in the prohibitive category. However, it is important to note that at the local authority level the policy responses vary considerably. For instance, Lee-Smith and Memon (1994: 67–84) noted that in Kenya policy responses to urban agriculture varied from being very prohibitive (e.g. in Kisumu) to being laissez-faire (in the larger municipalities of Nairobi and Mombasa) and proactive (in the smaller local authorities such as Isiolo and Kitui). In Kitui urban cultivators have access to crop extension services and generally enjoy public support for their activities.

If the present harsh economic conditions in these countries persist, the number of the urban poor involved in urban agricultural activities is likely to increase as unemployment worsens. Given the crisis created by the unprecedented drift to the urban centres there is need for African policymakers to address the issue of urban agriculture in a different manner from what has been the approach so far. For instance, urban agriculture should be allowed to continue, but should be

supported under regulated conditions. Cultivation close to streambanks should be discouraged because that contributes to environmental degradation and river siltation. However, other open land not yet ready for development could be utilised for urban agricultural purposes by individual cultivators or registered cooperatives.

There is need to establish the extent to which urban agriculture is a potential, albeit partial solution to the problem of food insecurity at the household level in urban areas. Can urban agriculture be more than a coping strategy for the marginalised? Does capital-intensive horticulture or dairying in urban areas have a role and what factors constrain the development of intensive commercial agriculture in Africa's urban areas?

In considering the spatial coexistence of urban agriculture and other land uses it is important to note that urban agriculture can use land in ways that do not threaten the urban environment by avoiding use of hazard-prone or environmentally-sensitive land ill-suited for cultivation. For example, operations could be confined to specific locations where there is minimum environmental damage resulting and the cultivators should be encouraged to cultivate crops which will help achieve food security at the household level. In addition, there is need for municipal authorities to develop formal, organised structures to administer urban agriculture.

### References

- Drakakis-Smith, D.W. (1992). "Strategies for Meeting Basic Food Needs in Harare, Zimbabwe", in J. Baker and P.O. Pedersen (eds) *Small Towns and Rural Development in Africa under Conditions of Stress*. Uppsala Nordiska Afrikainstitutet.
- Drakakis-Smith, D. and P. Kivell (1990). "Urban Food Distribution and Consumption: The Case of Harare", in A.M. Findlay, R. Paddison and J.A. Dawson (eds) *Retailing Environments in Developing Countries*. London: Routledge.
- Drakakis-Smith, D. and D. Tevera (1993). *Informal Food Retailing in Harare*. Goteborgs: Occasional Paper No. 7. Kulturgeografiska Institutionen, Goteborgs Universitet.
- Drakakis-Smith, D. et al. (1995). "Urban Poverty and Urban Agriculture: An Overview of the Linkages in Harare", *Habitat International* Vol.19 No. 2.
- Egziabher, A.G. et al. (1994). *Cities Feeding People*. Nairobi, IDRC.
- ENDA-Zimbabwe (1994). *Urban Agriculture in Harare*. Harare: Unpublished Report.
- Freeman, D.B. (1991). *A City of Farmers: Informal Urban Agriculture in the Open Spaces of Nairobi, Kenya*. Kingston: McGill-Queen's University Press.
- Freeman, D.B. (1993). "Survival Strategy or Business Training Ground? The Significance of Urban Agriculture for the Advancement of Women in African Cities", *African Studies Review* Vol. 36 No. 3.

- Lado, C. (1990) "Informal Urban Agriculture in Nairobi, Kenya: Problem or Resource in Development and Land Use Planning?", *Land Use Policy* Vol.7.
- Lamba, D. (1993). "Urban Agriculture: Eastern Africa", in L. J. A. Mougeot and D. Masse (eds) *Urban Environment Management*. Ottawa: IDRC.
- Lee-Smith, D. and P.A. Memon (1994). "Urban Agriculture in Kenya", in A.G. Egziabher et al. (eds) *Cities Feeding People*. Nairobi : IDRC.
- Maxwell, D. and S. Zziwa (1992). *Urban Agriculture in Africa: The Case of Kampala*. Nairobi: ACTS Press.
- Mazambani, D. (1982a). *Aspects of Peri-Urban Cultivation and Deforestation Around Salisbury, 1955-1980*. Harare: Unpublished MA Thesis. Department of Geography, University of Zimbabwe.
- Mazambani, D. (1982b). "Peri-Urban Cultivation in Greater Harare", *The Zimbabwe Science News* Vol. 16 No. 6.
- Mazingira Institute (1985). *Urban Food and Fuel Project*. Nairobi: Mazingira Institute.
- Mbiba, B. (1994). "Institutional Responses to Uncontrolled Urban Cultivation in Harare: Prohibitive or Accommodative?", *Environment and Urbanization* Vol. 6 No.1.
- Mbiba, B. (1995). "Classification and Description of Urban Agriculture in Harare", *Development Southern Africa* Vol.12 No. 1.
- Mosha, A.C. (1991). "Urban Farming Practices in Tanzania", *Review of Rural and Urban Planning in Southern and Eastern Africa* Vol.1.
- Mougeot, L.J.A. (1994). "Leading Urban Agriculture Into the 21st Century: Renewed Institutional Interest", in A.G. Egziabher et al. (eds) *Cities Feeding People*. Nairobi: IDRC.
- Rakodi, C. (1985). "Self-Reliance or Survival: Food Production in African Cities", *African Urban Studies* Vol. 21.
- Rakodi, C. (1988a). "Urban Agriculture: Research Questions and Zambian Evidence", *Journal of Modern African Studies* Vol. 26.
- Rakodi, C. (1988b). "Urban Agriculture in Lusaka, Zambia", in I. Dankelman and J. Davidson (eds) *Women and Environment in the Third World: Alliance for the Future*. London: Earthscan.
- Rogerson, C.M. (1992). "Feeding Africa's Cities: The Role and Potential for Urban Agriculture", *Africa Insight* Vol. 22 No. 4.
- Sanyal, B. (1986). *Urban Cultivation in East Africa, Food-Energy Nexus Report*. Tokyo: United Nations University.
- Sanyal, B. (1987). "Urban Cultivation Amidst Modernization: How Should We Interpret It?", *Journal of Planning Education and Research* Vol. 6.
- Smit, J. and J. Nasr (1992). "Urban Agriculture for Sustainable Cities: Using Wastes and Idle Land and Water Bodies as Resources", *Environment and Urbanisation* Vol. 4 No. 2.
- Tevera, D.S. (1995). "The Medicine that Might Kill the Patient: Structural Adjustment and Urban Poverty in Zimbabwe", in D. Simon et al. (eds) *Structurally Adjusted Africa*. London: Pluto Press.
- Watts, T. and W. Bransby-Williams (1978). "Do Mosquitoes Breed in Maize Plant Axils?" *Medical Journal of Zambia* Vol. 12.
- Wekwete, K.H. (1993). "Urban Agriculture in Southern and Eastern Africa", in L.J.A. Mougeot and D. Masse (eds) *Urban Environment Management*. Ottawa: IDRC.

# Policy & Politics

Leading the field in policy studies for 25 years

Editor: **Randall Smith**, University of Bristol.  
Abstracts Editor: **Derek Hawes**, University of Bristol.

*Policy & Politics* is a multi-disciplinary journal concerned with the origins, impact and evaluation of public policy across a range of areas, including health, housing, governance, labour markets, education, the environment, urban policy and community care.

Recent articles include:

**Sarah Payne**, Psychiatric care in the community: does it fail young men?; **Christian Toft**, Constitutional choice, multi-level government and social security systems in Great Britain, Germany and Denmark; **Francis G. Castles and Christopher Pierson**, A new convergence? Recent policy developments in the United Kingdom, Australia and New Zealand.

## Special issue January 1997

### Regionalism in England: current trends and future prospects

Edited jointly by Peter John and Alan Whitehead, this issue includes articles on:

- Business partnerships and regional government (Coulson)
- The government offices for the English regions (Mawson and Spencer)
- Regionalisation, regional institutions and economic development (Evans and Harding)

*Policy & Politics*, volume 25, 1997 (4 issues):

	UK/Europe	Rest of the world
Institutions	£87	£95
Individuals	£39	£42

Published quarterly in January, April, July and October.

#### Subscriptions to *Policy & Politics*

- I would like to subscribe to *Policy & Politics* and enclose payment. (Cheques should be made payable to University of Bristol)
- Please send me a pro forma invoice for:
- Individuals
  - Institutions
- Please send me a free inspection copy of *Policy & Politics*

Name: .....

Organisation: .....

Address: .....

Return to: **The Policy Press**, University of Bristol, Rodney Lodge, Grange Road, Bristol BS8 4EA

Tel: +44(0) 117 974 1117,

Fax: +44 (0) 117 973 7308

E-mail: [tpp-pp@bris.ac.uk](mailto:tpp-pp@bris.ac.uk)



*Policy & Politics* is published by The Policy Press on behalf of the School for Policy Studies, University of Bristol.

ISSN 0305-5736

## URBAN FOOD PRODUCERS' DECISION MAKING: A CASE STUDY OF KIBERA, CITY OF NAIROBI, KENYA

**P. R. Dennery**

c/o Dr Luc Mougeot, International Development Research Centre, P.O. Box 8500, Ottawa, Ontario, Canada, K1G 3H9

### Abstract

Accepted April, 1996

*This paper presents findings from a study of decision making by urban food producers<sup>1</sup>. The food producers resided in Kibera, City of Nairobi's largest informal settlement. The study used primarily qualitative methods to investigate how food producers with limited material and monetary resources engage in urban agriculture. The practices of urban food producers served as the entry point of the examination of decision making processes. The availability of cash within the household; the value producers place on food for home consumption; the availability of labour; and the risks associated with insecure land tenure, theft and land degradation were the factors which most influenced the practices of urban food producers. Examples from the study will be used to illustrate the effect of these factors. An overview of the types of relationships urban food producers have with other household members and with the community at large will be touched on in the latter sections of the paper.*

### Résumé

*Cet article analyse la prise de décision des producteurs urbains de bas revenus<sup>1</sup> en se fondant sur des études de cas dans Kibera, le lotissement informel le plus peuplé de la ville de Nairobi, au Kenya. L'étude a recours surtout à des méthodes qualitatives pour documenter comment des producteurs d'aliments dotés de maigres ressources matérielles ou monétaires s'engagent dans l'agriculture urbaine. Leurs pratiques servent de point de départ pour reconstruire les processus décisionnels dont elles résultent. Les facteurs les plus influents sur ces choix de pratiques sont: la disponibilité d'argent comptant au sein du ménage, la valeur que les producteurs accordent à la nourriture pour l'autoconsommation, la disponibilité de main-d'oeuvre, les risques associés à l'accès précaire à la terre, au vol et à la dégradation des sols. Quelques exemples illustrent l'effet de ces facteurs sur les pratiques élues par les producteurs. L'article enfin brosse un éventail des types de relations que les producteurs entretiennent avec les autres membres de leur ménage, ainsi qu'avec leur communauté.*

### Introduction

Poor urban dwellers are found in increasing proportion within urban centres. Husain and Lunven (1987:50–61) suggested that the population slum settlements in the city of Nairobi could be increasing by 25 to 30 percent annually. The majority of slum settlement dwellers have to create their own means of support since employment in the formal sector is increasingly scarce. The livelihood strategies on which poor urbanites rely are often informal and sometimes illegal (Bibangambah, 1992: 303–313). Urban food production is one such livelihood strategy, but it is often misunderstood by urban planners and municipal governments.

The formulation of effective policy and successful projects which account for and promote urban food production activities is dependent on knowing more about how food producers make decisions. So far, little is known about the factors which shape producer decisions. Many decisions revolve around the allocation of resources such as land, labour, money and produce. Relations within the household and outside the household are also important considerations when examining urban producer decision making. The findings presented below are intended to give some insight into the mind-set of the most important actors in urban food production: the urban food producers.

### Urban Food Production

In the past decade, there have been two major studies on urban agriculture in the City of Nairobi. The first study was carried out by the Mazingira Institute (Lee-Smith et al., 1987) and the City of Nairobi was one of six Kenyan urban centres that were studied. The majority of the households surveyed were engaged in backyard gardening. Animal production activities were included in the study as was food production by urban dwellers in rural areas. The second study was done by Freeman (1991: 1–22) and looked at cultivation by individual producers in the open spaces of the City of Nairobi. Both these studies were primarily quantitative and provided useful information regarding the age, sex, length of residence in the City of Nairobi, income and practices of urban food producers. These two studies were also carried out at a time when unbuilt land was still relatively abundant in the city.

Lee-Smith et al. (1987) and Freeman (1991) presented strong arguments as to why municipal and national governments should move towards recognising and supporting urban agriculture. Unfortunately, there has been little progress in this direction, especially in the City of Nairobi. A legal or institutional framework supportive of urban agriculture and related activities (composting, waste water and organic waste recycling, among others) is non-

---

*Acknowledgements*—Special thanks to Dr Peter M. Ngau of the Department of Urban and Regional Planning, University of Nairobi for his assistance during fieldwork. The study was carried out with the aid of a grant from the International Development Research Centre, Ottawa, Canada.

existent. One of the few encouraging developments for urban agriculture in Kenya has been the establishment of the Green Towns project by the Ministry of Local Government. The aim of the project is to assist officials in the rapidly growing urban centres of Kisii, Homa Bay and Busia to formulate environmentally sound urban development plans (Grootenhuis, personal communication and Duchhart and Grootenhuis, 1993: 9–10). Ironically, the Green Towns project was developed based on the results of a food production initiative by the Undugu Society of Kenya in two informal settlements along the Nairobi River, a few kilometres from the Central Business District, City of Nairobi.

### Study Design

Most of the studies done on urban agriculture in Kenya and other East African countries have been based on questionnaire surveys administered to large numbers of respondents, in various locations across the urban centre and, in some cases, in a few different urban centres (see for example Lee-Smith et al., 1987; Maxwell and Zziwa, 1990; Freeman, 1991 and Sawio, 1993). As survey methods tend to obscure differences between producers, their households and different areas of the urban centres, the research methods selected for the present study were primarily qualitative. The number of producers involved in the fieldwork was deliberately kept low in order to take an in-depth look at decision making and resource allocation by urban food producers.

The producers who participated in the study resided in Kibera, a large informal settlement of City of Nairobi. Fieldwork was carried out between August and October of 1994. Four types of food producers took part in the study: case study informants (4), focus group participants (a total of 12 individuals in three focus groups), open-ended questionnaire respondents (7) and special interest interviewees (2). The fieldwork also included seven short interviews with community residents not involved in food production and conversations with representatives of four Non-Governmental Organisations (NGOs) and two government ministries. Considerable emphasis was placed on the four case studies as they provided an opportunity for repeated observations of individual producers within the context of their households.

### Kibera Food Producers

Kibera is an informal settlement in the City of Nairobi which dates back to late last century when Nubian soldiers were allowed to settle there. Because of its large area and the general absence of slum clearance, Kibera has grown exponentially since 1974. Population estimates for Kibera vary from roughly 250,000 (Matrix Development Consultants, 1993) to 800,000 (Mulili, personal communication). There are eleven villages within the settlement. Kibera is well-known for its vibrant small business sector. Matrix Development Consultants (1993: 17) cited over 7,300 enterprises. Data from respondents and observations give an indication of the variety of occupations producers and other Kibera residents engage in. The occupations encountered include selling fish, groundnuts or fresh

vegetables, preparing and selling street foods, making shoes and furniture, sewing, brewing alcohol, prostitution, selling drugs and medicinal plants, operating kiosks and construction among others. It is important to note that a great variation exists between the best-off and the worst-off households in Kibera (National Cooperative Housing Union Ltd., 1990).

Although the population of the settlement is ethnically diverse, the area's urban food producers are primarily Kamba and Kikuyu. On the other side of the Motoine River and Nairobi Dam, facing Kibera, there is a large open space where most Kibera food producers have their plots (figure 1). The producers refer to this area as Langata (actually this area is only one part of Langata Division). The Langata open space slopes down towards Nairobi Dam and has an important environmental function. Water from the dam is used to supply part of Nairobi's drinking water (Freeman, 1991). There are three types of crop production: rainfed cultivation, irrigation with sewage water and crop production close to waterways where waterlogging and periodic flooding occurs.

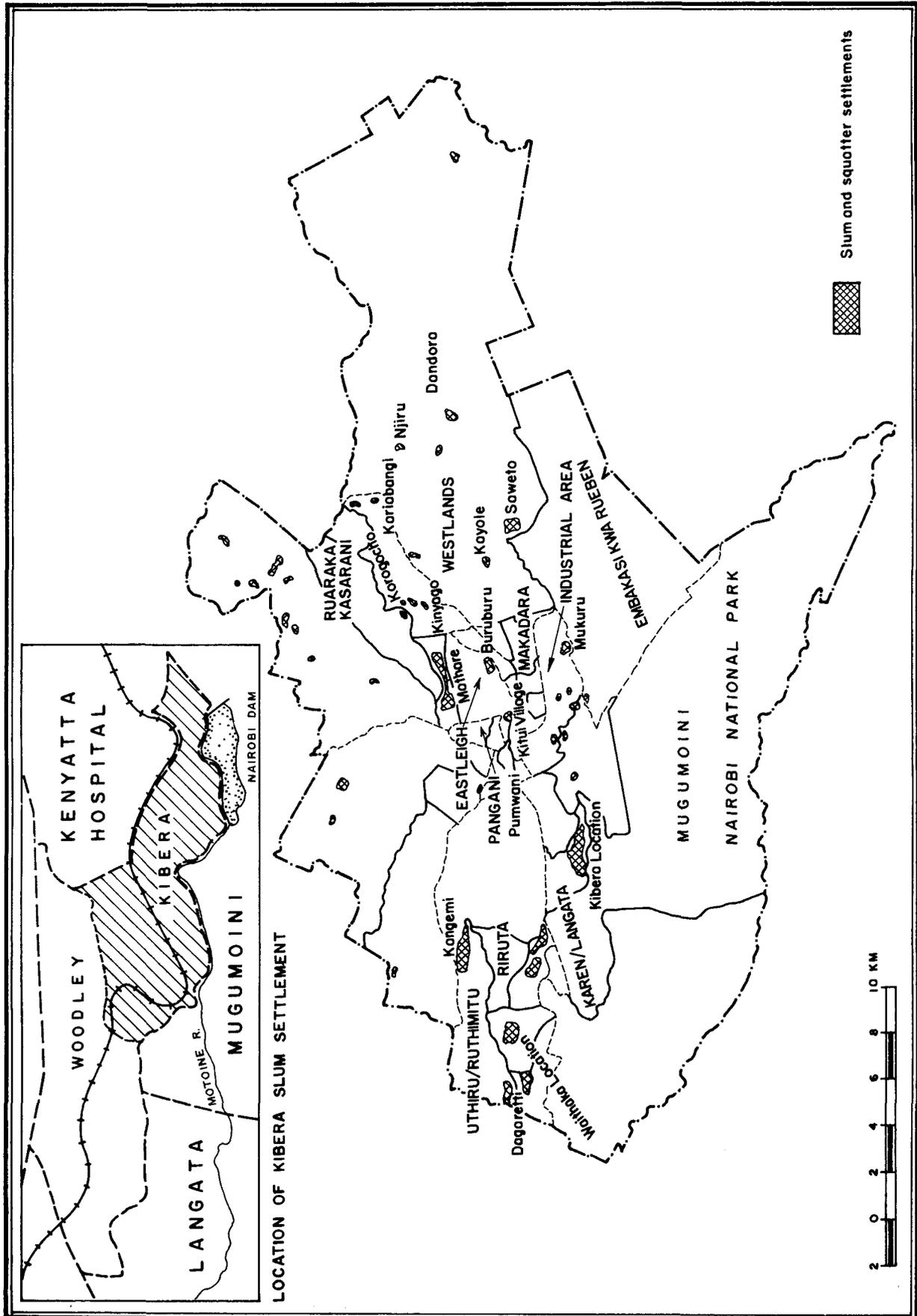
Typically, those who have been growing crops in the area for several years, cultivate more than one plot (*shamba* in Kiswahili). There are several reasons for this. Different plots offer different ecological conditions depending on topography, soil properties and proximity to water. There are a large number of producers in the area, therefore, it is difficult to obtain one large plot. Most producers try instead to obtain several small plots. If part or all of the food growing in one plot is stolen, having other plots can be an advantage.

If rainfall is timely and adequate, there are two seasons of planting. Maize is grown mostly during the long rains (April to June) but some fast maturing varieties can be grown during the short rains (October to December). Beans can be grown in both seasons. Aside from these two staples, sweet and Irish potatoes, kale (locally known as *sukuma wiki*) and cowpeas are commonly grown. Smaller flood prone areas are commonly planted to arrowroot (cocoyam), bananas and sugarcane. Pigeon peas, pumpkin, cassava and perennial crops are occasionally found among the staple crops. High value crops such as onion, tomato and Swiss chard (which Kenyans call spinach) are rarely seen due to theft. Intercropping is quite common. Crop rotation and irrigation with sewage water are practised by some producers. Animals are produced within the settlement of Kibera. Chickens are most numerous but ducks, sheep and goats are also common. Theft and poor sanitation are significant constraints for animal producers. Heavy losses, particularly of chickens, discourage producers and cause many producers to abandon animal production altogether.

A brief introduction of the case study informants will be given here as many of the examples below are drawn from the case studies. Each informant has been given a fictitious name in order to protect their identity. A summary of some of the major characteristics of the informants is presented in table 1.

Martha is 38, married, arrived in the City of Nairobi in 1975 and has seven children (1 to 15 years of age). This Kamba woman ventured into food production in 1979 after her vegetable selling business failed. Martha cultivates three plots but she and her husband have trouble making ends meet.

Figure 1, Map of informal settlements in Nairobi with inset of Kibera and approximate location of Langata open space



**Table 1, Selected Characteristics of the Four Case Study Informants in Kibera, City of Nairobi, Kenya**

	Martha	John	Joyce	Robert
Age	38	45	42	56
Ethnic group	Kamba	Kamba	Luhya	Kikuyu
No. of children	7	5	7	4
Household member with wage employment	none	wife (factory worker)	husband & son (railways & tailor)	son (mason)
No. of years in Kibera	19	14	8	12
No. of years cultivating	15	12	4	8
No. of plots	3	5	3	3

Source: Dennery 1995: 59

Martha's husband has difficulty obtaining casual work and though Martha often makes eight to ten trips a day to the neighbouring residential areas to sell water, she can only manage to make enough cash to buy food for one day.

John, 45, also Kamba, is married with 5 children (ages 3 to 22). His wife works at a factory. John came to the City of Nairobi in 1967. He was a carpenter until 1982 when his tools were stolen during a riot. With the help of a friend, John started in food production a few months later and now has five plots, of which two are irrigated with sewage water.

Joyce is the second wife of a Kenya Railways employee, age 42, Luhya, and has 7 children (4 of them reside in western Kenya with the first wife). She arrived in the City of Nairobi in 1986 to join her husband. Joyce started growing crops and raising animals in 1990 to keep from being idle. She has three large plots and keeps chickens in a confined area beside her house. Compared with the other informants, Joyce and her household are relatively well-off.

Robert is a 56-year-old Kikuyu man who resides alone in the City of Nairobi. His wife and four adult children live in Central Province, Kenya. Robert came to the city in search of a job in 1982 but could not find one. His brother gave him

a bit of money to buy seeds and Robert started food production in 1986. Interestingly, Robert's three sons come to Nairobi on the weekends to grow food on plots near their father's three plots.

When comparing the characteristics of the case study informants and those of the open-ended questionnaire respondents (table 2), a number of qualitative differences stand out. These are the number of children, the length of residence in Kibera and the number of plots. The four case study informants had food production as their main livelihood activity while five of the seven interview respondents had non-agricultural remunerative activities which take up a substantial amount of time<sup>2</sup>. The informants had an average of six children compared with two for the respondents. It appears as though the more mouths to feed the more time is devoted to food production. Of the four informants, Joyce was the only one who had resided in Kibera less than ten years. Joyce had lived in Kibera for eight years, the same time as the longest residing respondent. The fact that informants had a larger number of plots than respondents perhaps reflects both the greater food needs and the better access to production resources of well-established urban

**Table 2, Selected Characteristics of Interview Respondents Engaged in Food Production in Kibera, City of Nairobi, Kenya**

Respondent	1	2	3	4	5	6	7	average
Sex	male	female	male	female	female	male	male	
Age	28	22	50	30	34	40	32	33.7
No. of children	1	1	3	2	3	5	0	2.1
Ethnic group	Kamba	Kamba	Kamba	Kikuyu	Kamba	Kamba	Kikuyu	
Wage employment	runs kiosk/mason	none	security guard	none	city cleaner	watchman	mason	
Wage employment of spouse	runs kiosk	painter	none	city employee	mechanic	none	n/a	
No. of years in Kibera	2	5	5	6	8	6	3	5.0
No. of years cultivating	1	2	1	4	3	4	2	2.4
No. of plots	2	2	1	1	2	1	1	1.4

Source: Dennery, 1995: 84

residents. An important point emerges from the above: having a large household serves as an impetus for active engagement of at least one household member in food production as a main livelihood activity.

Another comparison can be made between producers on the basis of food production practices. In both of the single sex focus groups, producers pointed out several differences between established producers and those who had started only recently. New producers must purchase most or all their materials and have little experience/knowledge of how to successfully produce food in the City of Nairobi conditions. Established producers have to absorb the maintenance and replacement expenses for seeds, tools and in some cases, agricultural chemicals. Those who have engaged in food production for several years know what pitfalls to avoid (e.g.: harvesting maize and beans as quickly as possible to avoid theft) and the most efficient ways of carrying out tasks. New producers also claimed that their established counterparts had more money to devote to food production. This seems a valid statement as the households of established producers have benefited from several years of savings on food expenditure and cash from produce sales.

#### Access to Land

Food production has no clear legal status in the city of Nairobi and, in general, is not well viewed by local policy-makers<sup>3</sup>. This needs to be kept in mind while looking at issues of land use for food production. In recent years, there has been a trend towards the privatisation of Government of Kenya land, particularly in the City of Nairobi where market demand for land is high. The privatisation process has taken place without the simultaneous implementation of an overall land-use plan. Clear policies regarding urban food production, protection of fragile land or of waterways and multiple uses of land are not in place.

Part of the land in the Langata Area of the City of Nairobi was formerly Government of Kenya land which the Prison Authority had been allocated. The area closest to the residential estates was allocated to the National Housing Corporation by the Government of Kenya for house building but construction of new estates has not yet started. The remainder was or is waterway reserve, public or private land. Much of the Prison Authority land was privatised starting in 1989. In the last two or three years, a number of those who have obtained title deeds for the land have begun building houses for rent to middle income earners on the former Prison Authority land, resulting in the displacement of several food producers.

An additional difficulty presents itself regarding land-use and land tenure in Langata and metropolitan area of Nairobi as a whole. Traditionally, as Freeman (1991: 74–78) carefully explains, the Kikuyu had in the past recognised the rights of those who occupied agricultural land as belonging to someone else. They were considered tenants of a landlord. If the landlord evicted the tenant or the tenant chose to leave, “the tenant is allowed to harvest his standing crops even after termination by the landlord” (Maini, 1967 as cited by Freeman, 1991: 75). None of the food producers encountered during the study paid money to the Government of Kenya or

the bearer of the title for the plots they used. Rather they were “*de facto* tenants abiding by customary usufruct principles” (Freeman, 1991: 78), fully conscious of the fact that they did not own the land.

Insecurity of tenure has a marked effect on the practices of urban cultivators. Loss of access to land has a permanent and devastating impact. Some producers, like Robert, whose plots border on or are near construction sites, feel the threat of losing access to their plots quite acutely. Yet they continue to take the risk of losing the fruit of their labour. In particular, producers whose main occupation is agriculture have few other alternatives. These are usually among those who failed to get jobs when they came from rural areas. The chance of getting one now is very remote.

Cultivators try to cut their losses in case of eviction. Most evictions take place without prior notification and without compensation. Usually neither the building contractors nor the legal owners are ever seen by the producers. One day, the producer goes to his/her plot only to find their crop cut down and building materials on the site. Having more than one plot, as is common for the long established Kibera producer, is a form of insurance against eviction. Not all the plots are likely to be built upon at the same time and some plots may be spared that fate altogether. Eventually, producers may find themselves in a position where they no longer have any plots to grow food in. One producer encountered during the study was almost at that point. This woman said that she used to have many plots but was down to two plots. Most of the plots were simply reclaimed by the title bearer. In one case, the maize she had planted was simply cut down to make way for the expansion of Kibera. She was not given a chance to harvest anything which had been growing there.

Perennial, long maturing and semi-permanent crops are avoided by most Langata area producers. Martha is the only informant who had a number of different fruit trees in her plot. She planted them between 1979 and 1985. When asked why no other trees were planted, Martha replied that she began to realise that she would lose everything in case of eviction. Plots such as Joyce's (situated on Ministry of Lands and Settlement property) or those along the Nairobi Dam are less threatened by privatisation than those on what was formerly Prison Authority property. This may explain why Joyce, after four years of cultivation, has planted her first mango tree and why several producers are using vegetation to transform the edge of the dam into soil. When trees are present, it is usually for one of three reasons: either they were planted a while ago, they are located in an area which is certain or unlikely to become a building site or their use-value is high. Common examples are fruit trees such mango and guava, perennials like banana or papaya and longer maturing crops such as pigeon pea. In any case, the surface areas covered are relatively small compared to those devoted to growing fast maturing staple crops like maize and beans. In essence, choosing crops which mature rapidly increases the likelihood of successfully harvesting them.

There is a clear difference between longer-established producers and those wanting to venture into food production. According to one of the focus group participants, “all those with the best *shambas* are those who started early.” In other

words, as would have been expected, the areas with fertile soil and favourable topography and location were occupied first. In a sense there are three categories of producers: those who had plots in Langata prior to 1989, those who started just after the Prison Authority left and those who started later than this. The producers in the first category had the best possible situation. Having worked in the area for a number of seasons, those producers could identify which sites had the best soil or drainage in the event they wanted additional plots and took over the plots when the Prison Authority left. The second type of producers still had a relative advantage over the last type as the former still had the possibility of choosing plots and, possibly, of adding other plots. The trend towards land privatisation which existed in the City of Nairobi before and during fieldwork will probably entail a shortened engagement in food production for those who started their plots after 1989. Unlike Martha, Robert or John, such producers may not benefit from a 10- to 15-year horizon for urban food production.

By the early 1990s, the demand for vacant land in the Langata area which new producers could use exceeded the supply. At the same time, more established producers wishing to expand their operations were (and are still) looking for additional plots. Similarly, construction sites have increased in number and slum settlement expansion continues, effectively reducing the amount of land available for cultivation. At present, virtually all areas which can be cultivated are in use. In some cases, this includes highly oxidised, marginal soils and steep slopes. For established producers, seeking to expand, he or she can ask other producers whether they or someone they know is planning to cease production (due to relocation, sickness and discouragement, among others). Alternatively and probably more frequently, a producer who is about to leave approaches someone whom he/she thinks may be interested in the plot.

The situation is considerably more complicated and risky for those seeking a plot for the first time. Who one knows becomes crucial to obtaining a plot. Individuals who do not have the appropriate social ties are shut out of food production altogether. Long-established producers know what gifts they must give to secure the use of an additional plot (usually a kilo of sugar and an agreed upon sum of money). Such producers also know who is the 'real'<sup>4</sup> user of the plot and do not risk losing money or crops to temporary occupants. A potential producer will probably experience some difficulty obtaining land. He or she is unlikely to have extensive contact with established producers unless the producer is already a friend, relative or neighbour. For example, kinship ties proved useful for a producer who started in 1992. Upon retiring, his uncle returned to his rural home and left the former the *shamba*. Sharing a common ethnic affiliation or living or working in the same place can also facilitate securing access to land. Recent migrants to the City of Nairobi usually start off by living with relatives and then find a place of their own nearby. Similarly, producers who have plots in Langata will be more inclined to pass them on to either a relative or a co-ethnic they know well rather than to a stranger. Thus there appears to be a form of limited control by the producers over land. The distribution of new plots is not arbitrary or based

on a first come first served model. Kinship, ethnicity and belonging to the right social networks is of critical importance to those entering the arena of food production for the first time as well as to those already operating within it. Despite these insights, the gap between the Langata producer and those who have the ultimate control over land-use in Langata (the wealthy, Nairobi City Council and the Ministry of Lands and Settlement) remains very wide.

### Food Production and Household Economic Status

Food production has different functions for different households. For low- and very low-income households, food production ranges from between being one of several ways of meeting basic needs to being the only or principal way of doing so. Where on this continuum a household lies depends primarily on economic realities. In Kibera, making a living exclusively from agriculture is uncommon. In most if not all cases, other livelihood strategies are used in addition to food production, particularly in times of low agricultural production (in between seasons and just after the rains begin). However, food production plays a key role in household maintenance. Each of the producers in the study indicated that the economic status of their household would fall substantially if they were no longer able to produce some of their own food. Freeman (1991: 110) expressed the sentiments of producers in this way: "The vast majority of urban cultivators, both male and female, are very poor, landless, subsistence dwellers for whom their little *shamba* may mean the difference between a precarious but continued existence in the city and a full-blown family catastrophe."

At the individual and household level, microeconomic factors sometimes strongly influence the decisions producers make with regards to the resources they put into and obtain from food production. For example, Martha planted *sukuma wiki* and spinach, which produce leaves for sale in a matter of weeks in order to improve cash flow. Producer decisions also reflect external policy conditions like changing food prices and land use. In 1994, maize was planted with increasing frequency in and around the City of Nairobi, despite a high risk of theft because of a sharp rise in maize prices.

The ability of the producer and the members of the household to generate cash and goods determines some of the options available to the producer. Employment of either the producer or a household member, particularly of spouses, raises the household higher up the economic ladder. Among the informants, there was a clear difference between the two households where a spouse was regularly employed and the two where this was not the case. Other factors affecting financial position were number of dependent children, whether the children resided in the City of Nairobi or in the rural home, access to and types of casual employment and ability to borrow money from friends or relatives.

Cultivation is a seasonal enterprise. For Kibera producers it is an activity which occupies the better part of the year. Even with sewage water irrigation, the amount of food produced in the fields varies with the season. When the long and short rains are good, food supplies are generally lowest in October/November (during planting and weeding) and

from January to April (the longer of the two dry seasons). The end of the long rains and maize harvest (end of June/beginning of July) is the time when the *shamba* supplies the most produce. Regardless of the time of year, households purchase foods which they cannot grow. When food supplies are low, the household must have the cash to buy supplementary food. Better-off households, such as Joyce's can more easily cope with the increased spending need at those times than households such as Martha's. In a sense, regular wage employment serves as a buffer against declining food supplies. Households relying on casual work to help make ends meet faced an additional constraint as some of these jobs are available only at certain times of the year. For example, construction generally takes place when there is little or no rain.

Seasonal variations in food available from the *shamba* imply a change in producer and household financial priorities. Joyce's case best exemplified this. Low production meant that she spent less on more expensive food items like meat, cooking oil and wheat flour and that more of the household's cash was spent on food. Joyce's decision to plant cowpeas and beans very early effectively shortened the period when nothing was growing in the field. Since the rain fell at appropriate times, the cowpeas she had planted were producing leaves by mid-October. Unlike Martha, Joyce did not need to seek an alternate source of income in casual work. She relied either on her husband's income or on proceeds from the sale of cowpea leaves to make food purchases. Thus, production practices, the number of mouths to feed and wage employment can all affect buffering capacity. The periods of low food supply in the City of Nairobi correspond with the opening of the three school terms. For low-income producer households with school-age children, this presents a tremendous difficulty. Those households are expected to allocate already scarce financial resources to school-related expenses. Poor households have few options. They cannot cut into the food budget any further and so must try to defer fee payments or take one or more children out of school (permanently or temporarily). This aspect of seasonality can potentially have very adverse consequences over the long-term.

Intra-mensual variations have a similar effect as seasonal variations in production. Most wage earners are paid at the end of the month. Depending on income and expenses, it is not unusual for households to run short of cash by mid-month. Certain expenses such as rent must be paid all at once, early in the month. The results are a substantial reduction in available cash—common in all households—not just those with regular wage earners. Decision-making patterns are likely to change even within the course of a month. When translated into practical implications for the urban food producer, material and cash resources are likely to be diverted away from agriculture. If seeds or other inputs need to be purchased, these expenses are put off until more cash is available. Carrying out operations on a timely basis may be hindered resulting in a reduction in the amount of food obtained.

### Value of Food from a Producer Perspective

Food producers choose between keeping produce for home consumption and selling or giving away part of it. The allocation of food among various uses depends on the productive capacity of the producer and on the financial position of the household. Production capacity depends on numerous factors. The most important of these are the area cultivated, available labour and soil quality. Kibera producers make a number of decisions concerning how their produce is allocated prior to planting their fields. Essential to an understanding of these decisions is the value producers attribute to the produce they obtain. From the viewpoint of the producers, market-bought food is so expensive that in Martha's words "the food we harvest has a greater value compared with any wages we would get if I or another family member got a job." Produce can be used as food (use-value) or can be easily converted to cash unlike wages which have only an exchange value.

Kibera producers assert that they do not produce for sale: male and female participants of the focus groups expressly stated that they do not grow food for sale and that their plots were too small for commercial production. This is true of crops such as beans, sweet potatoes, arrowroot and cowpeas which are primarily planted for home consumption. Surpluses of these crops may be sold or sent to a rural home. However, in the case of green maize and *sukuma wiki*, the producers' assertion is not consistent with what actually takes place. These two crops are in large part sold. The fear that maize will be stolen if left in the field until it is mature is common among producers. The crop is quickly removed from the fields, particularly if the plots are not guarded at night. Maize cobs which are mature or close to maturity are dried and kept for household use. The green cobs, which usually constitute the bulk of the crop are sold. *Sukuma wiki* is a crop which is planted primarily for home consumption but for which the surplus is largely sold. This crop is also useful in maintaining cash flow because sales take place frequently over the course of two or three months.

Sales of surplus can be considered advantageous to the producer as he/she can obtain cash without cutting into the household's food supply. Kibera producers are particularly reluctant to part with the portion of produce set aside for household use. However, when needs arise, a producer with limited financial resources may feel that he/she has no choice but to sell, compromising household food supply. Those with comparably larger disposable incomes can choose between selling produce and using non-agricultural income. Other options are borrowing money and doing casual work. The preference for one of these options depends largely on the producer's access to each of them and on the nature of the need.

Agricultural produce is not commonly traded, though some Kibera shopkeepers will accept produce in exchange for other goods. Produce may also be used as gifts at weddings or when a producer visits his/her rural home. It may also be given or shared with neighbours and friends. The latter depends on the will of the producer and, in all likelihood, on the availability of the produce. In this respect, food production

has both an economic and a social function. All informants said that they gave produce as gifts. John gave produce as a wedding gift, Robert contributes food at church functions, weddings and funerals and Joyce gives food to neighbours, relatives and friends. Martha gives small amounts of maize to friends when she is able. Arrowroot was commonly given away as a gift.

Evidence from this study indicates that cash income from food sales is used specifically to meet other basic needs. In the women's focus group, answering the question "what do they use the money they obtain from selling produce for?", said they use it primarily for food and basics such as paraffin and maize or wheat flour. The participants in the men's focus group gave a similar answer. They said sales of produce should not even be called "a sale" but rather "an exchange" as the money is used to buy something else the household needs. One man gave this example: "When I grow *sukuma wiki* and my children want something else to eat, I sell it and buy the children whatever other food they want." Payment of school fees appears to be an important use for revenue from produce sales. Produce is sometimes sold because school fees must be paid. A single mother, with 6 adult children, said she educated all her children through agriculture.

Households which rely solely or partly on agricultural production for their livelihood have an advantage over those who do not. They can substitute food for cash that would otherwise be spent on food. Kibera producers considered reduction of food expenses to be one of the main benefits of urban agriculture. It is also an important motivation for continuing. The greater the quantity/acreage and the larger the variety of crops produced, the more cultivators are able to satisfy a larger proportion of their food needs. Non-producers in the study depended in large part on market and store bought food. Only one of seven stated that he occasionally received food from his rural home. The others had to rely on their own or their spouse's work to put food on the table. In some cases, street food sellers can use unsold wares for household use. One respondent said that his wife was occasionally paid with food for her labour. The low food supply and relatively high food prices during dry season probably had a lesser impact on households engaged in food production than on other households. Low-income food producers usually have the added benefits of a more diverse diet prior to the start of dry season as well as stored food from recent harvests. Though non-producers seem more likely to be engaged in some form of income generation, food to them had neither a use-value nor an exchange-value.

### Producers in the Household

By looking at an individual's personal history, a relationship between producer knowledge and current practices emerges. Most urban producers learn the basic skills they use for cultivation in rural areas. Often, one or both parents were food producers. The events which occurred around the time the informants decided to start food production appear to have been the initial push or incentive which led to the decision. Serious financial difficulties preceded the entry of three out of four case study informants into food production. For John, Martha and Robert, starting

to produce food for the household came out of necessity. Martha and John's respective small business ventures had failed. Martha had been selling market-bought vegetables while John's carpentry tools had been stolen. Robert had not been able to find a job. Robert says "I was not educated and knew I would not be able to find a job." Robert's age when he arrived in the City of Nairobi (48) was probably an additional hindrance to finding work. Joyce is the only one who faced no dire circumstances when she first embarked on food production. Joyce began food production because she hated being idle. In Joyce's view, staying at the house with nothing to do leads to gossip and quarrels. In food production, Joyce also saw an opportunity to diminish her food purchases and for having something on hand which she can sell in times of need. The informants were not asked if they had considered alternatives to food production while they were deciding whether or not to begin. It is possible that there may have been no reasonable alternatives due to lack of capital to (re)start a small enterprise and to relatively low potential for wage employment.

Both men and women were very close in how they perceive urban agricultural activities. Women see food production as part of their duty in feeding the family. Obtaining income from sales was considered secondary to saving on food expenditure. The participants in the women's focus group added that producing food increased their financial independence. They did not need to ask their husbands for cash to buy food or make small purchases. This is an important benefit for women as their status within the household may improve. Men appear more inclined to see food production as a form of self-employment, providing the means for household survival/sustenance. When men talk about urban agriculture, they generally place less emphasis on feeding the household and more on supporting it. Sales and profit were not a prime motivation of male producers in Kibera. The men in the focus group repeatedly said that food production is not a business. These men specified that the plots are generally too small to produce a substantial surplus.

Gender differences were not clearly apparent with regards to the proportion of food kept for home consumption versus what is sold. Capacity to produce food, the number of household members who depend on this food and the availability of income from non-agricultural sources largely determine this proportion. Since men are more likely to live in the City of Nairobi alone, it is probable that they spend less on food than female producers. As Joyce and several women in the focus group pointed out, the financial responsibilities of Kenyan men are inherently different than those of Kenyan women. Men are expected to provide an income by working outside the home while women are expected to help within the home.

At the intra-household level, conceptualisation of the sexual division of labour translates into attitudes which shape the allocation of resources and producer practices. Women in the focus group said that because they prepare food, they know the needs of the household and, therefore, decide how much produce to sell and what food to buy. The food production activities of women also shape their expectations as to how their spouses should allocate income from non-

agricultural work. One of the reasons why Joyce expects her husband to pay for school fees is because her food production efforts largely eliminate household food expenditure.

Male and female producers had comparable views of who is involved in decision-making. Whether decisions affecting the household were made jointly or individually depended on the importance of the decision (buying maize flour for the next meal vs borrowing money for a medical bill) and on the nature of the power relationships. Consultation with the spouse served as a means of preserving marital harmony. For example, Joyce makes decisions regarding the *shamba* alone but consults with her husband only to maintain good relations and keep him up-to-date.

Self-perception and decision-making power are intimately related. To illustrate, Joyce's case is compared with Martha's. Joyce's social status and self-confidence place her in a more advantageous position when making decisions. By having more material and social resources, Joyce effectively has more freedom in her choices. Joyce can save money for unexpected expenses, borrow money from her neighbours or from the various groups she is involved in and has the option of hiring labour and a vehicle to transport her green maize. When her husband's salary advance and the balance of his salary runs out, Joyce can sell produce without negatively affecting household food supply. Because Joyce has access to and control over a relatively large amount of produce and because she can count on a regular source of cash, the consequences of poor decisions are not likely to have an extremely negative impact on her household. In Martha's case, her decision-making power is undermined by two factors: how she views herself in relation to her husband and her capacity to meet the needs of her family alone. Martha must provide most of the food and cash for household use. In spite of her hard-working nature and of the fact that she almost single-handedly ensures her household's survival, Martha still prefers to portray her husband as the one in charge of making decisions. But in actual fact, Martha makes important decisions which affect the time she devotes to food production versus other activities, the amount of produce she will eventually obtain and the availability of cash for food and other expenses (school fees for the children). In Martha's case, necessity often determines choice. Martha's options are more limited than Joyce's as she cannot sell produce without affecting household food supply, except when selling surplus *sukuma wiki*.

### Labour Management

For Langata producers, the busiest times in the fields occur in October–November and April–May during ploughing, planting and weeding. Since these tasks have to be performed on a timely basis, control over one's own labour and access to that of others become meaningful determinants of potential productivity. Control over one's own labour was of greater importance than labour assistance from another source be it spouses, relatives, friends or hired workers. Among the case study informants, there was a range of extent to which producers controlled their own labour. At one end, Robert had few external demands on his time when he was in Kibera. Robert could, therefore, devote most of his time

to agricultural tasks. At the other end, much of Martha's time was taken up by the care of young children and procuring a small income which she used for food and school fees. The immediate needs of the family took precedence over the longer term need to produce her own food. Martha's decision to make daily survival a priority forces her to trade-off time for food production for time selling water. Martha's ability to control her agricultural labour time is limited by her responsibilities to others.

For agricultural work, access to the labour of others can take the form of direct assistance in the *shamba* or assistance with other tasks which free up the producer for such work. A general complaint among Kibera producers was the reluctance of others to assist with food production. Relatives, friends and neighbours were found to be more willing to help with housework than with cultivation. Women in the focus group said they could only once ask friends to help in the *shamba* and that these were usually people the women knew quite well. However, when labour demands were the greatest, it was possible for most of the producers interviewed to obtain limited assistance either at home or in the field, particularly from a spouse. Yet overall, individual producers worked alone for the better part of the time in the field.

Bottlenecks caused by shortage of labour were obvious in John's case. For him, there were three major difficulties: First, he had more land under cultivation than it is possible for one person to manage. Although John could keep up with the work on the two plots irrigated with sewage water, the other two plots he cultivated were weedy. The fifth plot was left fallow because the soil was poor and, perhaps also, because John was not able to devote time to improving its fertility. Second, John had only limited access to his wife's labour. John's claim that he could ask his wife to stay away from work anytime in order to help him in the fields is probably not completely true. The opportunity cost of lost income is likely to exceed what would be gained from the labour assistance his wife can supply. John's assertion that he would beat her if she refused to miss work is probably more accurate. The third difficulty was his indebtedness. John had fairly sizeable debts which could not be paid back using income from sales of produce and his wife's salary. Consequently, he did casual work on occasion but was reluctant to give details concerning its nature. John's exemplifies the problem labour shortage can pose for the urban food producer.

Even though cultivation was the main occupation of the case study informants, considerable time was spent on other activities. Opportunities for casual wage work and self-employment differ depending on sex, age, education and will. Several livelihood activities performed by Kibera residents are physically demanding (e.g., carrying water and construction work) and poorly paid. Household maintenance activities such as collecting water, washing clothes are time consuming, particularly in dry season. Focus group data indicated that what was true of Martha is also true of other women with young children: they could not go to the field in the morning until the children were fed and that they had to cut short the time they spent working in order to return home to prepare meals. Instances of competition between food

production and other productive or reproductive activities can thus occur on a daily as well as on a seasonal basis.

A number of the labour issues presented above are directly linked to the prevailing gender ideology in Kenya. Female urban producers must carry out most of the care and maintenance of the household, regardless of the time they devote to food production or other livelihood activities. Women, individually and in groups, commented that they tended to stay in the field longer than men (to harvest vegetables for the evening meal for instance). Even if both men and women had worked in the *shamba* together, the woman was still responsible for fetching water and preparing meals once she returned to the house. In couples, this division of tasks did not vary when one or both persons had full-time or part-time employment, regardless of who was employed. Even though John's wife works all day in the industrial area, she is still expected to prepare the evening meal. Part of the difficulty in obtaining labour assistance stems from the prevailing attitude towards food production, particularly towards food production within the city. Many urban residents left their rural homes to search for wage employment in non-agricultural work and reject the notion that food production is an appropriate urban activity.

#### Producers in the Community

Previous studies provide little insight into the relationships between urban food producers and the communities to which they belong. Yet producers are, to a greater or lesser extent, affected by the relationships they have with those outside their household, be it with relatives, neighbours, friends or acquaintances. There are also events in the village, the community or higher levels which translate into changes at various levels of society. Urban producers are active participants in a number of different types of social networks. Involvement in a network depends both on need and on personality. In a dense settlement such as Kibera, contact with others is an integral part of daily life. Such contacts not only fulfil a social need but can provide access to money, material goods and information. Urban producers contribute to various groups in the hope of creating a safety net in case of emergency. Surprisingly, contact among producers is usually limited and producer organisations tend to last only a few months. The issue of producer organisation is of great importance to the design and implementation of new policy. An effective organisational base would facilitate contact with, participation of, and negotiation with the urban food producers who would be affected by such policies. Land tenure and land-use issues could potentially be addressed if contact between producers and policy-makers were made easier.

Food producers try to ensure that they have some form of assistance in case of illness or death. Few Kibera residents can afford to save money as individuals. However, group membership provides a good incentive for residents to save together. A common form of group involvement is membership in a welfare or funeral group. Most welfare and funeral groups require a contribution of Ksh. 50 or 100 a month.<sup>5</sup> The assets of welfare groups are usually distributed on a lottery basis. They are also loaned or given to members

in case of crisis. In view of the costs associated with transporting bodies to the morgue and then (usually) to a rural home for burial, there are a large number of funeral groups which exist as separate entities from welfare groups. The assistance such groups can provide to very low- and low-income households is invaluable. Alone, few producers or non-producers would be able to recover from the financial burden a severe illness or the death of a household member would create. The social support these groups provide is of equal or greater importance than financial assistance as members can encourage each other and share their concerns.

Financial position may serve as a hindrance or barrier to group involvement. Due to her relatively low cash income, Martha experienced difficulty in participating in one group and cannot join one group as she would like to. Martha had to abandon membership in an NGO-based savings group for the purchase of school uniforms due to lack of funds. Martha shared her desire to join a group of women from her ethnic group. These women perform dances for which they get paid. Money for this group's activities was obtained from the registration fees of new members and monthly contributions. The funds were pooled with the intention of buying land to build rental houses on. Thus joining a group or maintaining membership in a group can be problematic when cash flow is reduced and survival becomes the top priority.

During the fieldwork, there was surprisingly little evidence of producer pooling together to purchase seed or other inputs or to obtain credit. However, urban food producers, particularly those with plots in Langata, share many common problems (e.g., theft, uncertainty with regards to land and labour shortages). It appears as though urban food producers function relatively independently despite their physical proximity. There are, however, a few groups of urban food producers although there is no umbrella organisation in which all Kibera food producers can participate. Langata producers associate together in two types of groups. The first type tends to form around causes or events and are often of a temporary nature. The second type usually involves a longer term goal. Distinctions between the two types are sometimes unclear. These points are illustrated below.

Martha reported that in May 1994, the crops of several producers were slashed down to make way for a school on land adjacent to a nearby residential estate. The victims spread word among the producers. The groups approached the Divisional Chief to demand compensation for the victims' lost crops. Compensation was later granted. Several groups form each year around the time maize harvest begins. These groups raise money and manpower for guarding the crops at night. In some cases, guards are hired and in others male producers contribute the necessary labour. One such group obtained a letter from the Kibera Divisional Chief which they can show if police enquire about the nature of their presence in the fields at night. Joyce was the treasurer of the same or a similar group. She mentioned the organisation was also involved in lobbying the Chief for compensation in case of land/crops loss and for permanent use of land in the area. Participation in the group appears to vary according to availability of time and money and to the extent to which producers would see a need for protection from theft. Robert

had also associated with a few producers to hire a pick-up truck for the bulk purchase of cow manure.

Organisations motivated by longer term goals often require sizeable monetary investments. Consequently, these organisations are more volatile because of the temptation to use group funds for other purposes. John described his experience with one of these groups. "In 1985, we formed a group and each contributed 3,000 shillings a year. When the money totalled 60,000 shillings, the leaders of the group disappeared with the money and were never seen in Kibera again. This is why I keep my involvement with other producers to a minimum." John did not disclose what the purpose of the group was but, due to the sum involved, it was probably related to purchasing land. Mismanagement of relatively sizeable funds engenders mistrust and may preclude future participation. Even for relatively modest ventures, like the water selling or chicken raising projects proposed by participants in the third focus group, pooling and administering funds is an important issue. The producers in this group were concerned that they would not be able to raise all the necessary funds and were unsure where to get financial assistance. Availability of money may preclude the participation of poorer producers, reinforce unequal power relations and skew access to land and other resources.

Problems with the organisation of producers were brought up, particularly during the third focus group discussion. Lack of information about the existence of such organisations was frustrating for some of those present. Martha was particularly upset to hear that Robert and Joyce were leaders while she had no idea these groups even existed. The requirement that there be at least 25 participants for the group to be given official recognition by the Chief and Ministry of Culture and Social Services was another hurdle. Individual producers occasionally attributed the fact that they did not personally know the producers in the neighbouring plots to the fact that each person has his/her own concerns and should not be bothered. Due to their multiple livelihood and social activities, absences and schedules, organising meetings with large numbers of producers is difficult. Unless the producers feel they might obtain a tangible benefit from group efforts, they are unwilling to participate. Several producers complained that the existing groups rarely do anything of value aside from guarding plots. Issues of prices for their produce and access to land were not being effectively tackled by such groups.

There appeared to be other difficulties as well. Seasonal variations in labour demands place a severe constraint on the time producers can commit to group activities. During planting and weeding, only the most dedicated producers could be expected to attend group meetings. The only exception being when urgent action is needed to obtain compensation in case of eviction. The continuity of group activities and the planning process are disrupted. Some effort is required to build the organisation back to where it was prior to the disruption. The majority of producers are either Kamba or Kikuyu. There may be some tension between those two groups and with other groups. In a large group, the Kamba and Kikuyu will likely be more numerous than other groups such as the Luhya. Political preferences and cultural values

are thus likely to affect group cohesion. Divisions already exist along gender lines as women may not share the same interests or may feel more strongly about certain issues than men. Differences in economic status may further alienate producers from each other.

An important disincentive for producers to organise is the powerlessness they feel with regards to their largest problem: ensuring short- and long-term access to land. The problem quickly takes on political dimensions as it involves Government of Kenya officials, urban developers and wealthy investors. Kibera producers, as individuals and a group, see the land issue as a problem with no solution or one which inevitably means a victory for more powerful groups in Kenyan society. Realistically, how can low- and very low-income food producers, who are considered squatters and reside in an informal settlement, make their concerns heard and acted upon by those in power positions? The most obvious ways of tackling these issues are for producers to organise themselves in groups. One possibility for organising producers is to form small cells of producers based on the welfare group model. These cells could then be brought together under a larger umbrella organisation. The next step would be for Community-Based Organisations or Non-Governmental Organisations to assist producers in communicating with policymakers project and thereby help bridge the gap through advocacy. Considerable care will be needed in selecting advocates. Because land tenure issues easily become politicised in Kenya, advocates would have to be seen as politically neutral.

Once again, the producers will have to know beforehand how they could potentially benefit from forming groups and having other organisations assist them with lobbying. From the producers' perspective, the obstacles to forming new or enhancing existing organisations may seem to outweigh the advantages of maintaining the *status quo*. However, an incentive for producers to organise could be created if the producers felt their voices would really be heard by the Government of Kenya.

### Conclusion

The findings presented above deal primarily with three agricultural resources: land, produce and labour. These resources have both a social and an economic value. Land tenure and land-use management emerged as critical issues during the fieldwork. In the Langata area, food production is in direct competition with housing. There are no clear provisions for compensation in case of eviction nor are there arrangements for producers to use land in Langata or elsewhere for cultivation. Although environmentally desirable, a land-use plan for the area which includes management of the Nairobi Dam watershed and preliminary treatment of sewage for use by food producers is unlikely to be successful unless a middle ground between producers and policymakers is created.

Labour availability is a key factor determining the amount of produce obtained. Among food producing households, there is usually one adult who devotes most of his or her time to agriculture, particularly in households with large number of dependent children. Gender issues were significant

determinants of access to and control over agricultural and non-agricultural labour. Women in Kibera and in Kenya overall are responsible for chores such as fetching water and preparing meals regardless of how much time they have spent in the field. Male producers are more likely to have casual or regular work apart from food production than are female producers. Completing agricultural operations on a timely basis often requires reallocation of individual and household labour.

Urban food production is an important livelihood strategy for Kibera households. Produce is a multiple-use resource, providing food, generating revenues from sales, allowing savings on food expenditure and produce has an exchange value in that it is used to meet other basic needs. In most cases, income and employment from a source other than urban food production are needed to help make ends meet, since the amount and types of produce are not sufficient to meet all household food needs. Food producers and their households are less vulnerable to changes in market prices for food compared to their non-producing counterparts.

Kibera food producers operate within a constantly changing context. Therefore decisions and their practical outcomes are constantly revised in order to satisfy the needs of the moment. Many of the practices of Kibera food producers serve to fulfil short-term needs, yet these practices are nonetheless part of a longer term strategy for household food self-sufficiency and for maintaining an adequate cash flow.

#### Notes

- <sup>1</sup> A full description of the study and its results can be found in Dennery (1995).
- <sup>2</sup> The purposive sampling method used to select informants and respondents partially accounts for these differences.
- <sup>3</sup> Lee-Smith and Memon (1993) state that cultivation in Nairobi is allowed except on public streets while Freeman (1993) describes cultivation as technically illegal.
- <sup>4</sup> A producer may loan or rent the plot to someone else on occasion or may hire someone to work on it for him or her. Therefore, the person currently using the land may not be the initial producer and, according to Kibera producers, the former cannot pass on the prerogative to use that land. The initial user is the one with whom negotiations must be undertaken.
- <sup>5</sup> At the time of the fieldwork, the Kenyan Shilling was appreciating rapidly. 1 US dollar was equivalent to between Kshs. 35 and 45.

#### References

- Bibangambah, J.R. (1992). "Macro-Level Constraints and the Growth of the Informal Sector in Uganda", in J. Baker and P.O. Pederson (eds) *The Rural-Urban Interface: Expansion and Adaptation*. Uppsala, Sweden: The Scandinavian Institute for African Studies.
- Dennery P.R. (1995). *Inside Urban Agriculture: An Exploration of Food Producer Decision Making in a Nairobi Slum*. The Netherlands: M.Sc. thesis. Department of Ecological Agriculture, Wageningen Agricultural University.
- Duchhart, I. and F. Grootenhuis (1993). "Urban Agriculture, Incentive Planning and Green Towns", *Urban Perspectives* Vol. 4 No. 1.
- Freeman, D.B. (1991). *A City of Farmers: Informal Urban Agriculture in the Open Spaces of Nairobi, Kenya*. Montreal: McGill-Queen's University Press.
- Freeman, D.B. (1993). "Survival Strategy or Business Training Ground? The Significance of Urban Agriculture for the Advancement of Women in African Cities", *African Studies Review* Vol. 36.
- Husain, A. and P. Lunven (1987). "Urbanization and Hunger in the Cities", *Food and Nutrition Bulletin* Vol. 9 No. 4.
- Lee-Smith, D. et al. (1987). *Urban Food Production and the Cooking Fuel Situation in Urban Kenya—National Report: Results of a 1985 National Survey*. Nairobi: Mazingira Institute.
- Maxwell, D. and S. Zziwa (1990). *Urban Agriculture: A Case Study of Kampala*. Makerere Institute of Social Research (Mimeograph), now published as *Urban Farming in Africa: The Case of Kampala, Uganda*. Nairobi: ACTS Press, 1992.
- Matrix Development Consultants (1993). *Nairobi's Informal Settlements: An Inventory*. Nairobi: Report PN-ABH-741 prepared for USAID/REDSO/ESA.
- Memon, P.A. and D. Lee-Smith (1993). "Urban Agriculture in Kenya", *Canadian Journal of African Studies* Vol. 27 No.1.
- National Cooperative Housing Union Ltd. (1990). *A Survey of Informal Settlements in Nairobi*. Nairobi: NACHU.
- Sawio, C.J. (1993). *Feeding the Urban Masses?: Towards an Understanding of the Dynamics of Urban Agriculture and Land-Use Change in Dar-es-Salaam, Tanzania*. Worcester: Unpublished Ph.D. dissertation. Clark University.

Journals from SAGE

*New at SAGE in 1997!*

## JOURNAL OF EUROPEAN SOCIAL POLICY

Edited by Graham Room and Anne Jamieson  
both at University of Bath, UK

*"extremely impressive... the journal can be thoroughly recommended."* - European Access

The *Journal of European Social Policy* features leading specialists and academics across Europe providing expert analysis of key social policy issues. Both empirical research findings and theoretical developments are reported.

**Up-to-date European Briefing**

*"An extremely good Digest section follows developments in social Europe."* - Notabene

The Digest section offers an invaluable guide to the latest European social trends, new legislation, analysis of new and existing European Commission programmes and recent research.

Published quarterly ■ ISSN: 0958-9287

### Order Form for New Subscribers - Subscribe at the Introductory Rate



SAGE Publications Ltd, 6 Bonhill Street, London EC2A 4PU, UK  
Call our Subscription Hotline on +44 (0)171 330 1266

USA orders to be sent to:  
PO Box 5096, Thousand Oaks, CA 91359

Name \_\_\_\_\_

Address \_\_\_\_\_

\_\_\_\_\_ 6J91  
 I want to subscribe to *Journal of European Social Policy* starting with Volume 7 (1997)

**Introductory Rate for Individuals**  
£31/US\$49 (Usual Rate £39/US\$62)

**Institutional Rate** £115/US\$184

Please send me a brochure on the journal

#### Methods of Payment

I enclose a cheque (made payable to SAGE Publications Ltd) for: \_\_\_\_\_

Please invoice my credit card

Mastercard  Visa Amount: \_\_\_\_\_

Card No: \_\_\_\_\_

Expiry Date: \_\_\_\_\_ / \_\_\_\_\_

Signature: \_\_\_\_\_ Date: / /

## THE BEAUTIFUL CITY: GARDENS IN THIRD WORLD CITIES

Mary Cockram and Shelley Feldman, respectively

10 Frederick Street, Apt. 301, Hertford Connecticut 06105, USA, Email: igroc@aol.com or corgi@courant.infi.net; and  
Department of Rural Sociology, Warren Hall, Cornell University, Ithaca, New York 14853

### Abstract

Accepted May, 1996

*International comparisons of research on the agronomic, social, and policy aspects of urban agriculture share the conclusion that urban food production is an important component of household survival strategies. Most urban farmers are poorly educated women with families who possess only a few of the skills that are valued in the marketplace. Such women are among those most likely to invest their labour, but few other inputs, in urban agricultural production. These urban farmers creatively gain access to rights-of-way and use vacant land which they usually do not own to grow staple foods and raise small livestock near their dwellings. Hostile government policy and access to water are key constraints to their productive capacity. These conditions help explain why successful gardens are often limited to the rainy season. Yet, urban agriculture, which flourishes during difficult economic times, provides between 10 percent and 30 percent of the household budget. The paper concludes that urban farmers, like their rural counterparts, engage in work that is gender stereotyped. Since subsistence production is perceived to be part of women's responsibility for feeding the family, it is hardly surprising that women are the dominant participants in this art of urban survival.*

### Résumé

*L'article trace un bilan du statut de l'agriculture urbaine contemporaine qui permet de situer l'expérience africaine dans une perspective globale, notamment au niveau des cultures potagères. Les lois et normes culturelles interagissent avec les conditions agronomiques et techniques pour encourager ou contraindre localement le développement de cette agriculture. En premier lieu, l'article caractérise les producteurs eux-mêmes, puis expose les contraintes agronomiques et techniques les plus souvent affrontées par ceux-ci, ainsi que les stratégies auxquelles ils ont recours pour contourner ces contraintes ou en diminuer l'impact sur leurs activités. Les auteurs discutent ensuite certains obstacles et difficultés d'ordre socio-politique (politique gouvernementale, contrôle des ressources, division du travail et distribution des tâches au sein des ménages).*

### Introduction

It is not a new observation that the world's population is growing at a tremendous rate; it has more than doubled since 1950. Mega-cities and large urban centres, especially in the Third World, are experiencing unprecedented population increases—Mexico City, for example, grew by 9 million, an increase equal to the population of New York City in just the last 15 years. In 1950, only five large urban centres in the world had a population of over five million, but by 1990, 30 large urban centres had passed the five million mark (United Nations, 1991). Poor people make up the vast majority of this urban increase and the lack of adequate shelter, employment and food causes serious problems in urban areas. Urban centres are unable to provide services for new inhabitants and poor people often have little access to health care and education, few or inconvenient water and sewer services, poor roads and inadequate transportation.

This paper examines one way that urban residents make urban centres more livable and more productive by practising urban agriculture. Widely practised in the past and in the present, food production in and around urban areas provides much-needed food for urban residents and recycles organic wastes. Many urban dwellers, predominantly poor women, find that growing food is not only possible in the urban centre but is necessary for family maintenance. Gardens are commonly found in Third World urban centres and are used by the poor as a means to guarantee subsistence where

opportunities for employment in the formal sector are limited and income from the informal sector is low. Urban agriculture is not a new idea, but can be an effective development strategy in a supportive policy environment. This paper reviews the status of urban agriculture through an analysis of current grassroots urban agriculture, projects and literature on this issue which is scattered throughout a range of disciplinary journals. The first section examines the present status of urban agriculture around the world. Although knowledge is relatively limited and few comparable studies have been done, some common characteristics of urban agriculturists do emerge. The second section addresses common technical constraints to farming in urban centres, focusing on the obvious elements of land and water. The third section addresses social barriers and contradictions to sustaining urban agriculture in the current policy environment, examining as well issues related to household resource control, gender divisions of labour and household labour allocation.

### Urban Agriculture

Urban agriculture is broadly defined to include cultivating plants, raising animals and fish, and growing fungi within a greater metropolitan area or an urban centre. Plants, including herbaceous annuals and perennials, shrubs and trees may be consumed directly for food or may be used for fodder, fuel, building materials, medicine, ornamentation or industry. Food

crop production will be the focus of this paper because it is the most common type of urban agriculture in low-income neighbourhoods. Contrary to most expectations from more developed countries (MDCs), most urban gardens do not comprise primarily herbs and vegetables but include starchy staples, fruit trees and livestock. Urban agriculture as a research concern has been largely overlooked by the academic and development communities. Though urban agriculture is relevant to urban-focused disciplines such as urban planning sociology, geography, rural, environmental or natural resource departments, it does not fit neatly into any of these. Most published works on urban agriculture are anecdotal reports with few references or descriptive studies based on small sampling populations. The focus of most of these studies were gardeners or low-income urbanites, although research in Asia is often based on census data. The limited research attention to the question of urban agriculture may also be partially due to the Western concept of an urban centre as a place for non-agricultural activities. In Third World countries, urban officials often believe that gardens are a remnant of rural life that will disappear with acclimatisation to the urban environment, even though research does not support this. Officials are, therefore, reluctant to support policies or projects which reflect the legacy of rural life and its unmodern, rural and unsophisticated tie with the land. Despite the idea that gardens are tied to rural life, the urban poor continue to cultivate in urban centres as a way to address economic constraints and malnutrition and as a means to diversify household resources. They not only serve as a backstop against hunger but also decrease the cash requirements of the household and provide better quality food than poor urbanites can purchase. As in rural areas, home gardens are viewed as insurance against a break in food supply.

The primary reason people grow food in urban centres is to feed their families. Again and again, case studies point to economic necessity as the driving force behind urban agriculture and to the important role gardens play in household survival. In Kampala, Uganda, "urban farming tends to be an aspect of life for poor urban dwellers, who supplement their meager income by producing food on any available land" (Maxwell and Zziwa, 1990: 21). Gardens can provide an element of stability during inflation or economic crisis, when they increase in frequency. A surge of people in Kampala, Uganda and Lusaka, Zambia began gardening during the recent economic declines of the 1970s and early 1980s. Likewise, under conditions of job uncertainty or under- and unemployment, farming is likely to increase as Thaman (1977) found in Papua New Guinea and Fiji.

In the urban cash economy, urban residents are expected to be able to meet all their needs through the market, yet wages are often below that required to meet daily needs. Food is the most important requirement for survival and the cost of food alone can consume half or more of the household budget of low-income people (Sanyal, 1984 and Freeman, 1991). Studies of 10 Latin American urban centres indicate that the lowest income quartile households spend 50 to 69 percent of their income on food and beverage (Austin, 1980). When a household spends such a large proportion of its income on food, fluctuations in income often lead to changes

in the household food supply and nutritional level. Not surprisingly, malnutrition is common in urban centres around the world.

Food production saves the household money by replacing food that would have been purchased or, in very poor families, supplementing purchased food. In Africa, there is a "large proportion of very low-income households for whom urban farming becomes an important activity to supplement household budgets" such that "urban farming has become a critical variable in sustainability" (Wekwete, 1992: 131). Squatter settlement families in Nairobi, Kenya said that food was their first concern (Hake, 1977) and 65 percent of all households in the capital grew food on urban or periurban land (Freeman, 1991). Brownrigg (1985: 111) reported that an advantage of periurban squatter settlements is the "chance to plant a few fruit trees and vegetables and raise some small livestock".

Agriculture's contribution to the household can be significant, providing up to almost half of a household's food needs. Gardens provide 10 percent of the household budget in Lima, Peru (Ninez, 1985: 6–14) and 10–30 percent of food costs in Buenos Aires, Argentina, the equivalent of 5–20 percent of the total household budget (Gutman, 1987: 37–42). Agricultural production in low-income areas of Lusaka, Zambia was 10–15 percent of the food budget in the mid-1970s (Ledogar, 1978: 57–62). Lucenet (1988) found a range of 50–75 percent participation in agriculture among seven studies of Lusaka's low-income residents. Low-income residents in Kampala, Uganda produced nearly 45 percent of their own food in 1989 and calculations from gardeners' estimates indicate that 36 percent of the city's households were agricultural producers, of whom three-fourths were low-income (Maxwell and Zziwa, 1990). Large-scale employment of garden workers in food production has also been documented and is most common in urban centres with large green belts such as Maputo, Mozambique, where a third of the urban workforce was involved in agriculture in 1980 (Kolstrup, 1985). Clearly urban centres do encompass a wide range of people engaged in production. Urban agriculture is a remarkably widespread and important activity among the low-income urbanites. In Asia, food gardens are part of the urban landscape. As von Fleckenstein (1978) noted, food gardens are a part of Melanesian city life and are found in all yards "except perhaps those occupied by expatriates". Panjwani (1986:29) estimated that urban agriculture and associated waste recycling employs over a million people in Calcutta, India. And in China, 20 percent of the urban labour force is engaged in agriculture (Bjorklund, 1987: 2–15).

Urban gardeners are most often low-income, middle-aged women with families to support, little education and few marketable skills. In Kampala, gardeners were mostly married women with a household of seven and a similar profile of the urban farmer is found in Lusaka (Sanyal, 1984; Rakodi, 1988:495–515 and Maxwell and Zziwa, 1990). The average Nairobi farmer was a 38-year-old woman with six dependents. Almost half had previously gardened before starting their own plot (Freeman, 1991). Two-thirds of Port Moresby, Papua New Guinea farmers were low-income women with families to support and a few years of primary education (Vasey,

1985:37–43). In Bogotá, Colombia, Buenos Aires, Argentina and Santiago, Chile, gardeners are overwhelmingly low-income (Page, 1986: 38–44; Gutman, 1987: 37–42 and Robson, 1989: 28–29). In China, unlike many other places, urban farmers are full-time market producers who usually specialise in vegetable production, organised in collective teams by the state (Skinner, 1981: 215–280).

Though poor, most gardeners are neither recent migrants to the urban centre nor refugees; planting a garden seems to follow once a family has a place to live and has decided to stay in the urban centre. This is because gardening requires a degree of certainty of continued urban residence and a commitment of time in order to benefit from the investment of planting and caring for a garden. For example, gardeners had lived in Kampala for more than 10 years before beginning a garden (Maxwell and Zziwa, 1990) and in Nairobi for more than five. Over 70 percent of Nairobi farmers indicated that they planned to remain in Nairobi and not move back to the countryside (Freeman, 1991).

These subsistence gardeners grow staples and vegetables for their households and might market or exchange some food with friends and family. Staples such as maize, sweet potatoes and cassava predominate in most gardens. Vegetables are also grown, particularly in Asia, where vegetables comprise up to half the daily diet. Many gardens begin as a few banana or maize plants and increase in size and species variety as the gardener gains skill and confidence. The resources used for cultivation, including tools, inputs and planting materials are usually obtained from family or friends and the gardener and her family usually provide all the labour. Although most subsistence gardeners prefer to garden on their houseplot, many also plant gardens at a considerable distance from their home on land they do not own nor have secure tenure.

Although household subsistence gardens are by far the most common type, community gardens, cooperative farms and market gardens also exist in urban areas. Community gardens—which usually comprise groups of individual gardeners banding together to use larger tracts of land or to share information, tools or other resources—rarely emerge spontaneously. In the United States of America community gardening groups in urban centres aid members in acquiring access to land, water and a range of other services, but these formal organisations are much less common in the Third World. Urban gardening projects are usually designed as community gardens because they help to facilitate the sharing of information and resources and also because gardens help to advance the social agenda of some urban development initiatives which are generally aimed at poverty alleviation. As some note, self-reliance through urban agriculture can have a powerful psychological impact and be empowering, especially when groups of gardeners communicate with each other (Page, 1986: 38–44; Wade, 1987: 29–36). Silk (1982: 16) argued, for example, that through gardens “inner city residents help to develop neighborhood solidarity and thus grow not only vegetables, but hope”.

Communal gardens and cooperative farms where gardeners share the labour and divide the harvest and its proceeds are found primarily in socialist and communist societies. China boasts a well-developed urban agriculture

system based on communes, although there is evidence of friction between planners and farmers (Skinner, 1981: 215–280). Some of the most economically viable of Russia’s remaining state farms are those in or near urban centres specialising in high value horticultural and ornamental production; the communal structure is less cohesive with lower value staples in the rural areas. In Russian urban centres, institutions such as hospitals and prisons are turning to rooftop gardens to provide food in a difficult economic environment. In Maputo, cooperative farms, market gardens and individual subsistence farms co-exist on land set aside for urban agriculture.

Market gardens are also found in urban areas, typically at the urban centre’s edge. In Singapore and Hong Kong, market gardens are very common and provide the islands with 20–45 percent of their vegetable needs and 70–100 percent of poultry (Cheng, 1976; Tempelman and Suykerboud, 1983: 62–72 and Wong, 1983). These market gardens tend to be larger and more intensively cultivated than subsistence gardens. Market gardeners usually have secure land tenure, and thus they invest more in the garden than subsistence gardeners, growing high value vegetables and sometimes livestock (Niñez, 1984). Market gardens are usually the primary employment for at least one household member and often outside labour is hired. Men in agriculture are much more likely to be found in market gardens than subsistence production. Gardens serve as a source of employment, including paid day labour in subsistence gardens, long-term jobs in larger market or cooperative gardens and self-employment for millions of individuals. Urban gardens provide employment for women and others who are disadvantaged in the labour market, both through self-employment and waged work. In Kampala, for example, even small subsistence gardeners occasionally hire labour to help with harvest or planting, although workers regard agriculture as undesirable employment because of the heavy manual labour involved (Maxwell and Zziwa, 1990).

The prevalence of food production in urban areas indicates that many low-income people perceive it as a means to meet basic daily needs in a difficult environment. That urban dwellers cultivate in climates as diverse as dry Maputo, tropical Fiji and temperate Shanghai indicates that they consider agriculture a worthwhile endeavour to meet their food and income needs.

### Technical and Agronomic Issues

The physical surroundings of an urban centre, including the climate and the quality and availability of land and water, play a major role in the appearance of urban cultivation. Access to land and water are the most important and generally the most difficult garden resources for the poor to acquire. Agronomic issues such as the agricultural methods used, inputs available, and the crops grown interact with gardeners’ motivation and needs to produce unique cultivation systems in each city.

Land is, obviously, a critical component for urban gardens. Both the high cost of urban land and agriculture’s low profitability relative to other industries inhibit agriculture in urban areas and contribute to the common though false

belief that agriculture is seldom found in urban centres. Large amounts of urban land are idle, however, due to inaccessibility, speculation or because it is unsuited for building. Smit (1980: 499–506) estimated that there are 22 square miles of arable land in New York City and four or five in both Cleveland and Detroit, USA. Only half of the land in Bogotá, Colombia is developed (Lowe, 1992: 18–25). In planned urban centres, significant open space may be designated to remain open and these planned areas may be the most hospitable to urban agriculture. Nairobi, for example, was designed by the British with about one-fourth of the urban area deliberately left as open space (Freeman, 1991).

Although there is a large amount of unused land in urban areas, much of it is inaccessible by legal means to the poor, for whom buying land for agriculture is seldom a feasible proposal. Over half of non-gardening Lusakan, Zambia survey respondents did not cultivate because they did not have enough land to start a garden (Sanyal, 1984). The urban poor usually control only the lot on which their home is built, which may be no larger than the house itself. Still, roughly one-third to one-half of urban gardens worldwide are found on the gardener's land usually on the houseplot. Many people prefer to garden close to home because these gardens are easier to integrate into the routine of other work, because produce can be harvested as needed and immediately consumed, kitchen wastes can be added to the garden and these gardens are less vulnerable to theft than are more distant gardens.

For many people, the household plot is inappropriate or insufficient for cultivation. Some plant unauthorised 'guerrilla' gardens on vacant spaces along canals, roads and industrial installations in urban centres worldwide, despite uncertainty about harvesting what they have planted (Brownrigg, 1985). The most common spaces include vacant lots and land set aside for parks or future development, periurban land, riverbanks and rights-of-way for highways, railroads and utilities. For landowners, allowing gardens on vacant land may be a means to prevent other unwanted use of the land, such as trash dumping and shantytown construction. In Rio de Janeiro, Brazil, the electric company leased land under power lines to gardeners precisely for these reasons and the 172 hectares in cultivation produced food worth US\$ 10 million in 1983 (La Rovere, 1985). In China, where control over both land and agricultural production and management is centralised, land surrounding the largest built-up parts of the urban centre is allocated to agriculture and in particular to intensive vegetable production. As the urban centre grows, the state allocates more land at the urban fringe to agriculture and makes an effort to keep improved vegetable fields in production.

Like land, water is required for urban cultivation. In urban centres with a dry season, gardens are often rainfed and appear only in the rainy season. In other urban centres where a water source for irrigation is convenient, gardens occur year-round. Port Moresby residents who have functional water taps irrigate daily, for example, whereas residents without convenient access to water do not irrigate their gardens (Thaman, 1977). This is because few gardeners are willing to carry water to gardens and because other demands for water

such as for cooking and cleaning compete with agriculture. Gardeners are willing to pay for water they use for gardens.

Except for family labour, few inputs are used in urban centre plots. This is not surprising since most subsistence gardeners have little capital to invest. Planting materials are obtained from family and friends, kitchen wastes or the market at relatively low cost. Secure tenure of land correlates directly with higher investment and inputs; Lusakan farmers with secure land tenure invested much more than their counterparts without tenure (Sanyal, 1984) and market producers tend to use more inputs than subsistence gardeners. In African urban centres where gardens are illegal, farmers refrain from using chemical fertilisers and pesticides fearing that these inputs would draw attention to the garden. Moreover, chemical fertilisers and pesticides often are not available in the urban centre in the small quantities an urban gardener might need. Although the urban system produces a large range of organic wastes which could be used in agriculture, few are actually recycled. In Kinshasa, Zaire, gardeners pay to have market wastes transported to their gardens, where they sort the wastes and add the organic matter to the soil. The Chinese have a complex nightsoil collection system for agricultural utilisation, but cultural barriers and health concerns constrain the use of nightsoil elsewhere.

Agricultural technology from nearby rural regions may or may not be appropriate to the urban environment as climate conditions can differ over short distances. Plants face additional stress in the urban environment, including wind, compacted soils and damage from people and animals. The most productive urban agriculture systems use intensive technology, including the addition of organic wastes that are plentiful in urban areas. Gardeners in Asia and Latin America tend to use more intensive agricultural techniques such as raised beds and soil amendments than do most African cultivators. Intensified horticulture outside Shanghai has resulted in production levels equal to the best Japanese land and the harvest of up to nine crops per field annually (Ash, 1981: 188–221). The techniques urban gardeners use to produce food depend in large part on the materials at hand and the specific skills and knowledge of the gardener.

Most commercial hydroponic techniques are ill-adapted to poor urban areas because they have high start-up costs, require precise applications of imported chemicals, rely on dependable electricity and require a significant investment to learn the method. Hydroponic projects have had a varied success rate and the most successful have generally emphasised low technology, sustained technical support and/or a working model of the method (Wade, 1986: 30–34 and 1987: 29–36; Kendall, 1990: 18 and ILEIA, 1994). In a rooftop gardening project in St Petersburg, Russia, which taught a container gardening method and two hydroponic methods adapted to local materials and conditions, gardeners preferred the container technique because it was easier to understand and to maintain.

While the availability of land is critical to urban agriculture, people have found ways to cultivate tiny plots, often integrating small livestock such as poultry, rabbits and swine with the plants. Where in-ground gardens are not possible because of lack of space, poor soil or other problems,

gardeners prove to be creative adapters. They plant in containers that range from stacked tyres and tins to walls with built-in planters, although container gardening generally requires more frequent care and fertilisation (Urban Resource Systems, 1986 and ILEIA, 1994). As we will show in the next section, land tenure affects the amount of investment and labour households make in urban gardens.

### Social Determinants

While the availability of land, water and other resources determine whether urban cultivation is possible and affects agricultural productivity, social factors influence the accessibility of these resources and establishes a social climate for gardening. For example, the government policy, gender division of labour, allocation of household labour and other employment demands shape interest in urban agriculture as does the availability of other social infrastructure and support. This means that laws and cultural norms interact with agronomic and climatic conditions to encourage or limit the development of urban gardens.

Government policy plays an important role in legitimising or restricting urban cultivation. Land-use regulations affect whether agriculture is a temporary or permanent phenomenon through urban land-use policy, zoning laws, tax structures, and urban statutes, all of which can be modified to promote or discourage urban agriculture. Official attitudes toward urban agriculture range from mandates in China to benign neglect in Argentina to open hostility in Kenya.

Government policy toward agriculture is most constraining in Africa, where cultivation of food plants is banned outright in many urban centres and discouraged as backward and rural in others. Since no action is taken against the non-food plants and trees that are common in urban centres, it is clear that crops are singled out precisely because they are food crops. Interviews with urban officials in Kampala pointed to a cultural difference between gardeners and authorities. Whereas local officials tended to be aware of the important role of agriculture in household food supply, higher officials were less tolerant of farming which they believed to be a temporary holdover of rural culture (Maxwell and Zziwa, 1990). As noted earlier, however, most urban gardeners have lived in the urban centre for several years before planting a garden and engage in agriculture as an urban solution to an urban situation. Indeed, many of Nairobi's gardeners have lived in the city their entire lives.

Where governments have recognised the important role that agriculture plays in low-income households, policies favouring urban cultivation are found. These are most common in urban centres where food supply is very tight and government officials want to limit the funds spent on imported foodstuffs. In Addis Ababa, Ethiopia, the city government allocated vacant land for gardens and employed poor men to produce vegetables which were sold to the poor (Nelson, 1978: 25–46). In the early 1980s, the Government of Zambia promoted urban gardens in the national development plan in order to reduce food imports, increase urban food self-sufficiency and enable the poor to make their house payments (Sanyal, 1984). Local level officials, though, had a bigger impact on gardens, which were twice as common

in neighbourhoods where local authorities were favourable to urban agriculture (Rakodi, 1985: 53–63). Maputo, Mozambique has large green belts which were established by the socialist government at independence and are now loosely regulated by city government.

Asian governments have a longer tradition of supporting urban agriculture than in most of Africa. The Chinese government has long promoted food self-sufficiency in urban areas partly because the urban food supply is the state's responsibility. Chinese urban centres produce 85 percent of their own food and the 17 largest urban centres produced 60 percent of their needs in the early 1980s (Skinner, 1981: 215–280 and Bjorklund, 1987: 2–15). Many aspects of agricultural production are centrally planned, including major production decisions such as the quantity and type of crop. This leads to disagreement between planners who strive for uniform production of all crops and peasant producers who want to grow more profitable vegetables for 'self-advancement' (Bjorklund, 1987: 2–15).

Government support of urban agriculture usually increases the incidence of urban agriculture, but does not necessarily improve conditions for poor urban farmers. Housing projects in Butare, Rwanda were designed with lots big enough for gardens and with agronomists to provide technical advice to homeowners. Despite the fact that banana and sorghum are traditional backstops against famine and provide significant organic matter for the soil, the government prohibited their cultivation within urban areas in favour of 'modern' methods (Pottier, 1989: 461–477). The agronomists' recommendations were very different from those of traditional cultivators and were not always successful in the relatively poor soil and low-input conditions of the project.

Urban agriculture policies most affect low-income, middle-aged women with families to support, little education and few marketable skills: those who depend most on agriculture. The preponderance of women engaged in urban food production is due in part to gender roles. Women often have or assume responsibility for food and water provisioning, and cooking fuel. Many women in Lusaka consider gardening as part of their domestic work much like cooking. Urban gardening projects may help meet women's immediate practical gender needs for food, but frequently do not address deeper issues of gender equity and employment opportunities unless women use the gardening project as a forum to recognise strategic gender interests.

Gardening is also a response to women's disadvantaged position in the labour force. Women are frequently paid less than men for the same job. And in most urban centres, female-headed households represent a disproportionately high percentage of the poor because they have a high dependency ratio and limited access to services and employment. Although urban agriculture is a source of employment for women and other people disadvantaged in the labour market, these people may already be fully occupied meeting their basic needs through other forms of non-wage labour. Gardens are relatively flexible in the amount and timing of labour needed and can productively absorb extra labour. Labour is the single largest input in urban cultivation greater than any

other input, averaging one hour of labour per week for every 4–12 m<sup>2</sup> across urban centres worldwide, excluding travel time to and from the garden (Cockram, 1993). In the US, irrigation was the biggest labour investment in dry season gardens. Information on returns on labour time was not available for many Third World urban centres, but returns in USA gardens range from less than \$1/hour to more than \$13/hour, depending on the value of the crop grown (Cleveland et al., 1985: 694–696).

### Conclusion

Urban agriculture in the Third World is a means to combat poverty and increase food security on an individual level. It is a strategy used by poor urbanites to survive in harsh economic conditions as it provides significant quantities of fresh food and income for household members. For women with limited access to services or employment, gardens serve as a relatively reliable source of food and income that they themselves control. Urban gardens include a range of staple crops and vegetables where low-technology, low-input gardens reflect limited access to land, capital and other resources. Government policies can either facilitate or constrain urban food production.

Given the widespread interest in urban gardens by people around the world, it is hoped that this review of urban gardens will stimulate further research of and action on this 'rural' activity in the urban setting. More research is needed on several fronts since available information remains quite limited. In particular, comparable studies from different urban centres and countries are needed to determine who cultivates, why, and under what constraints production occurs. What farmer information and input needs are most limiting? How can agriculture use organic wastes produced in the urban environment and avoid contamination of crops? What kinds of policy proscription would best and least expensively lead to improved support for the urban poor's gardens? What are the effects of land-use policies which encourage urban gardens? How can extension and other support for urban gardens be structured so they are useful and an efficient expenditure for the producer? What role can NGOs play and how can governments work with NGOs to support urban cultivation? How successful are garden projects in community development?

Urban agriculture projects have been proposed to improve health and nutrition, to increase income and to promote social cohesion, but unless the community perceives the same problems, they seldom achieve their goals. Successful projects often emphasised local materials, crops and methods and provided sustained technical assistance to overcome the inevitable problems that arise. Projects requiring expensive or inaccessible inputs seldom lasted after the donor left.

Both national and urban governments can choose to increase the efficiency of small agriculturists through a range of actions. Inexpensive and immediate options include endorsements by prominent figures and the repeal of punitive laws which inhibit agriculture. Relaxing land-use and zoning legislation, especially in areas unsuited for construction, would also encourage agriculture. More costly incentives include increasing the size of houseplots in housing projects

or setting aside undeveloped areas of urban or periurban land for agriculture. Other supportive actions include subsidising inputs in the small quantities urban farmers need, encouraging or establishing composting systems for urban wastes and providing technical support for gardeners. Even without government support, urban food production contributes substantially to the well-being of urban centres' poorest residents. Increased government approval of agriculture could create a viable solution to the growing problem of urban poverty.

### References

- Ash, R. (1981). "The Quest for Food Self-Sufficiency", in Christopher Howe (ed.) *Shanghai: Revolution and Development in an Asian Metropolis*. Cambridge: Cambridge University Press.
- Austin, J.E. (1980). *Confronting Urban Malnutrition: The Design of Nutrition Programs*. Washington, DC: World Bank Occasional Paper No. 28.
- Bjorklund, E.M. (1987). "Olericulture and Urban Development in China", *Tijdschrift voor Economische en Sociale Geografie* Vol. 78 No.1.
- Brownrigg, L. (1985). *Home Gardening in International Development: What the Literature Shows*. Washington, DC: LIFE.
- Centro de Educación y Tecnología (CET) (1989). *El Huerto Familiar Urbano*. Valparaíso, Chile: Cetal Ediciones.
- Cheng Siok-Hwa (1976). "The State of Agriculture in Singapore", *Journal of Economic Development and Social Change in Asia* Vol.1 No. 1.
- Cleveland, D.A. et al. (1985). "Economic Value of Home Vegetable Gardens in an Urban Desert Environment", *HortScience* Vol. 20 No. 4.
- Cockram, M. (1993). *Agriculture in Third World Cities: The Invisible Food Supply*. Ithaca, New York: Master's thesis, Cornell University.
- Freeman, D.B. (1991). *A City of Farmers: Informal Urban Agriculture in the Open Spaces of Nairobi, Kenya*. London: McGill-Queen's University Press.
- Gutman, P. (1987). "Urban Agriculture: The Potential and Limitations of an Urban Self-Reliance Strategy", *Food and Nutrition Bulletin* Vol. 9 No. 2.
- Hake, A. (1977). *African Metropolis*. New York: St Martin's Press.
- ILEIA (1994). "Farming at Close Quarters", *Special issue of ILEIA Newsletter for Low External Input and Sustainable Agriculture* Vol. 10 No. 4.

- Kendall, S. (1990). "Rooftop Hydroponics in Bogotá" *Development Forum* Vol. 18 No. 3.
- Kolstrup, H. (1985). *Urban Agriculture: Food Production and Land Use Planning in Maputo—A Project Proposal*. Aarhus: Master's thesis, School of Architecture.
- La Rovere, E.L. (1985). *Food and Energy in Rio de Janeiro: Provisioning the Poor*. Paris: Food Energy Nexus Programme, United Nations University.
- Ledogar, R.J. (1978). "Food and Survival in Lusaka's Self-Help Townships", *Carnets de l'enfance* Vol. 43.
- Lowe, M.D. (1992). "City Limits", *World Watch* Vol. 5 No.1.
- Lucenet, F.P. (1988). *Land for Housing the Poor Through Urban Agriculture: The Case of Lusaka, Zambia*. Cambridge Mass: Master's thesis, Massachusetts Institute of Technology.
- Maxwell, D. and S. Zziwa (1990). *Urban Agriculture: A Case Study of Kampala*. Kampala: Makerere Institute of Social Research.
- Nelson, J. (1978). "Peri-Urban Malnutrition: A Neglected Problem", *Carnets de l'enfance* Vol. 43.
- Niñez, V. (1984). *Household Gardens: Theoretical Considerations on An Old Survival Strategy*. Lima: International Potato Center.
- Niñez, V. (1985). "Working at Half-Potential: Constructive Analysis of Home Garden Programmes in the Lima Slums With Suggestions for An Alternative Approach", *Food and Nutrition Bulletin* Vol. 7 No. 3.
- Page, D. (1986). "Growing Hope in Santiago's Urban Organic Gardens", *Grassroots Development* Vol. 10 No. 2.
- Panjwani, N. (1986). "Calcutta's Backyard: Food and Jobs From Garbage Farms", *Development: Seeds of Change* Vol. 4.
- Pottier, J. (1989). "Three's a Crowd: Knowledge, Ignorance, and Power in the Context of Urban Agriculture in Rwanda", *Africa* Vol. 59 No. 4.
- Rakodi, C. (1985). "Self-Reliance or Survival? Food Production in African Cities, With Particular Reference to Zambia", *African Urban Studies* Vol. 21 No.1.
- Rakodi, C. (1988). "Urban Agriculture: Research Questions and Zambian Evidence", *Journal of Modern African Studies* Vol. 26 No. 3.
- Robson, E. (1989). "Growing Crops Without Land", *World Development* Vol. 2 No. 6.
- Sanyal, B. (1984). *Urban Agriculture: A Strategy of Survival in Zambia*. Los Angeles: Ph.D. dissertation, University of California.
- Silk, D. (1982). "The Potential of Urban Agriculture: Growing Vegetables—and Hope", *Alternative/Appropriate Technologies in Agriculture* Vol. 3 No. 2.
- Skinner, G.W. (1981). "Vegetable Supply and Marketing in Chinese Cities", in Donald L. Plucknett and Halsey L. Beemer, Jr. (eds) *Vegetable Farming Systems in China*. Boulder: Westview Press.
- Smit, J. (1980). "Urban and Metropolitan Agricultural Prospects", *Habitat International* Vol. 5 Nos. 3 and 4.
- Tempelman, G.J. and F.J.J. Suykerboud (1983). "Agriculture in Singapore: Problems of Space and Productivity", *Singapore Journal of Tropical Geography* Vol. 4 No. 1.
- Thaman, R.R. (1977). "Urban Gardening in Papua New Guinea and Fiji", pp. 146–168, in *The Melanesian Environment*. Canberra: Australian National University Press.
- United Nations (1991). *World Urbanization Prospects 1990: Estimates and Projections of Urban and Rural Populations and of Urban Agglomerations*. New York: United Nations.
- Urban Resource Systems (1986). *City Food: Crop Selection in Third World Cities*. Oakland: Platypus Press.
- Vasey, D.E. (1985). "Household Gardens and Their Niche in Port Moresby, Papua New Guinea", *Food and Nutrition Bulletin* Vol. 7 No. 3.
- von Fleckenstein, F. (1978). *Dooryard Food Gardens in Port Moresby: An Original Study of Morata Together With a Comparison of Other Studies Past and Present*. Occasional Paper, Economics Department, University of Papua New Guinea. Photocopy.
- Wade, I. (1986). "Food, Transport, and Zoning", *Development: Seeds of Change* Vol. 4.
- Wade, I. (1987). "Community Food Production in Cities of the Developing Nations", *Food and Nutrition Bulletin* Vol. 9 No. 2.
- Wekwete, K. (1992). "Africa", in R. Stren, R. White and J. Whitney (eds) *Sustainable Cities: Urbanization and the Environment in International Perspective*. Boulder: Westview Press.
- Wong, C.T. (1983). "Land-Use in Agriculture", in T.N. Chiu and C.L. So (eds) *A Geography of Hong Kong*. Hong Kong: Oxford University Press.

# A Current Bibliography on **AFRICAN AFFAIRS**

Editor: Paula Boesch • Book Review Editor: Kwame Nantambu

## EDITORIAL BOARD

Bayo Adebowale  
Daniel Compagnon  
Frederick I. B. Kayanja  
C. Tsehloane Keto  
Guy Martin  
Daniel G. Matthews  
Sibyl E. Moses  
Serah Mwanycky  
Roger Pfister  
Peter J. Schraeder

## *The Steady Drumbeat*

In a world where image is everything, the steady drumbeat of *A Current Bibliography on African Affairs* has done quite well in attracting a new generation of users. The pages of this Journal (begun before many of today's nations in Africa became independent) offer a compelling view of Africana from the mid to late 20th century.

### Journal

#### features:

Commentary  
Africa On-Line  
Features

Book Reviews

Bibliographical Section

Cumulative Author  
Index

Regional Index

## New Feature Section:

Africa-On-Line, our new section, is a first-of-its-kind guide to help the African affairs community explore and interpret the exploding diversity of information options available on the World Wide Web. This new service intends to provide essays, articles, bibliographical tools, directories and profiles other relevant telecommunication background information to stimulate access to key resources on African affairs.

This timely reference source, although primarily aimed at both limited and unlimited Internet and World Wide Web users, also will help those planning to go on line with the swarm of available information options. Africa-On-Line, in short, reflects Baywood's serious and sustained commitment to keep *A Current Bibliography on African Affairs* on the "cutting edge" by providing access to information vehicles and eschewing the questionable distinction between academic and popular offerings.

## Aims and Scopes:

To present a thoughtful selection of references to a considerable diversity of materials, not only in subject and geographical selection, but also to point the user toward an increasing range of resources focusing on a sociotechnical multiethnic approach to African affairs.

For all those interested in Africa, *A Current Bibliography on African Affairs* provides a current, comprehensive and annotated bibliography. Our source materials are both African and international. The Bibliographical Section is divided into two parts—General and Regional. Headings in these areas will adjust to accommodate current interests. The scope of the Journal will continue to grow reflecting the main viewpoints that exist for given topics.

## Subscription Information:

Price per volume—4 issues yearly

ISSN: 0011-3255 Institutional Rate: \$159.00

Postage & handling: \$6.50 U.S. & Canada, \$11.75 elsewhere

*Complimentary sample issue available upon request*

Baywood Publishing Company, Inc.

26 Austin Avenue, Amityville, NY 11701

Call (516) 691-1270 Fax (516) 691-1770 Call Toll-free (800) 638-7819

e-mail: baywood@baywood.com • web site: http://baywood.com

## OPEN SPACE CULTIVATION IN ZIMBABWE: A CASE STUDY OF GREATER HARARE, ZIMBABWE

Davison J. Gumbo and Takawira W. Ndiripo

ENDA-Zimbabwe, P. O. Box 3492, Harare, Zimbabwe; Fax: 263-4-301-156

### Abstract

Accepted September, 1995

*This article characterises the recent evolution of open-space cultivation in the City of Harare, Zimbabwe. Analyses are based on air-photographic surveys in 1990 and 1994 and a field survey including questionnaires applied in 1994 to a large sample of farming households in sectors where open-space cultivation is concentrated. The cultivated acreage nearly doubled over the period, more of the farmed areas in 1994 being associated with the more densely populated neighbourhoods, most of which are low-income areas. The study discusses the probable causes of this growth; its household survey indicates that economic factors do prevail. Also, homeowners are more likely than tenants or others to secure access to open spaces where to grow crops. Women predominate among producers and harvests mostly go to household subsistence. The study warns about degradation risks associated with the inappropriate farming of vulnerable land. Insecure land tenure deters most open-space producers from adopting conservationist practices. Changes are recommended to current legislation and planning process which should allow urban development to incorporate open-space cultivation as a transitional or mixed land-use, while also providing producers with sufficient tenure stability and encouraging a labour intensive type of market-oriented production.*

### Résumé

*Cet article caractérise l'évolution récente de la culture des espaces libres dans la ville de Harare au Zimbabwe. Les analyses se fondent sur l'interprétation de couvertures aéro-photographiques de 1990 et 1994 et le traitement de questionnaires administrés en 1994 à un vaste échantillon de ménages producteurs dans les principaux secteurs cultivés de la ville. Les croissances entre ces aires et les quartiers résidentiels plus densément occupés, la majorité à faibles revenus. L'étude disserte auteurs notent un quasi-dédoublement des aires activées durant la période, une association sur les causes probables de cette croissance, l'enquête indiquant que les mobiles d'ordre économique dominant. Ce sont les propriétaires de résidences qui ont le plus aisément accès aux espaces libres pour les cultiver. On note la participation prédominante de la femme et l'autoconsommation de la majeure partie des récoltes. L'étude alerte sur les risques d'érosion que pose la mise en culture inadéquate de terres susceptibles. Les auteurs soulignent le statut précaire d'occupation qui décourage l'adoption par les producteurs de mesures conservacionnistes. On y recommande des changements au niveau législatif et de la planification qui permettraient au développement de la ville d'y incorporer et reproduire la culture des espaces libres comme utilisation du sol transitionnelle ou mixte, tout en assurant un minimum de stabilité aux producteurs et y stimulant une production de marché qui soit travail-intensive.*

### Introduction

The City of Harare considers itself to be the 'Sunshine City', a city in which the cultivation of open spaces was considered to be repugnant. This position has been bolstered over the years by legislative framework that forbade cultivation within the Greater Harare, Zimbabwe. However, contrary to the 'tradition' and the stringent enforcement, there has been a gradual increase in the cultivation of open spaces in Harare over the recent years. Whereas there was only 4,822 ha cultivated in 1990, this figure rose to 9,289 ha in 1994, an increase of 92.6 percent (ENDA-Zimbabwe, 1994). That such an increase has occurred against the backdrop of tough law enforcement mechanisms signals the existence of some push factors on the households that are involved.

Urban agriculture may be described as the use of urban land for agricultural purposes. This occurs most often on undeveloped land that may be designated or zoned for uses other than agriculture. Urban agriculture practices range from vegetable and small stock production around residential

properties (on-plot activities) to cultivation of a variety of food crops in open spaces around Harare (off-plot cultivation). Urban agriculture occurring in open spaces (off-plot) is either illegal or semi-legal. For the majority of the cultivators, urban agriculture is illegal since they merely cultivate any open space without any permission from any authority. For the few urban agriculture groups or cooperatives, urban agriculture is semi-legal because these practitioners are allocated land by the local authorities. This form of urban agriculture is semi-legal because although permission to cultivate the land is given by the local authorities, no statutory amendments have been made to the land-use regulations.

The extent, nature and intensity of urban crop cultivation has some important ramifications on the economies of both households and urban authorities. Most importantly, however, it has some implications on the natural environment in the given urban areas. Thus, the subject of open space cultivation in Harare should be given greater attention, especially in the fields of policy and physical planning.

Although the land-use laws and regulations governing urban land-use have changed a little since 1980, there has been a growing culture of tolerance by the local authorities allowing the practice to go on unhindered. There are humanitarian, political and economic reasons for this. Of much significance are the woes of the late eighties and nineties. The effects of persistent droughts and the harsh realities of the Economic Structural Adjustment Programme (ESAP) have exacerbated the plight of the urban household in Harare and in particular the poor.

### Some Aspects of Urban Agriculture

Urban agriculture within Third World urban centres is now a reality. It includes all forms of agricultural activities and is carried out in basements, roof-tops, backyards, way-leaves and open spaces, among others (Smit and Nasr, 1992: 141–152 and van der Blik, 1992). While urban agriculture could be said to involve all income categories, this activity provides a key survival strategy for the urban poor. Factors promoting the urban agriculture growth include deteriorating national policies, such as (removal of subsidies, low wages, rising cost of living) unemployment, among others (Mosh, 1991). The same applies to Greater Harare.

Urban agriculture in Harare dates to as far back as 1985 (Mazambani, 1982a and 1982b: 134–138). However, prior to Zimbabwe's independence in 1980, local authorities in Harare tended to be strict in enforcing the urban planning regulations that forbade urban agriculture. There were strict controls to curb urban cultivation, particularly of open spaces. The main driving force for the increase in the practice of urban agriculture in Harare is economic. Most of economic hardships appear to be rooted squarely in the ESAP, one whose major objective was to improve the quality of life of the low income and disadvantaged groups in Zimbabwe. ESAP has had some impacts. For instance, the country has witnessed some fundamental changes in the economy. Cost of living has sharply risen, with a devastating effect on the urban low income households and the poor due to the removal of subsidies from basic commodities; cost recovery measures instituted in health and education; real wages have fallen largely due to inflation and worsened the position of the low income groups in Zimbabwe; formal sector employment has also fallen since the beginning of ESAP and as a consequence of this, low income households have started to engage in urban agriculture. Urban agriculture should be considered as one of the strategies for combating food shortages because it requires little investment capital and provides an alternative source of cheap food (in the face of mounting prices of basic commodities and source of direct household income through sale of surplus products or indirect through savings made by consuming own produce).

From the above, it will be realised that urban agriculture has the potential of playing a crucial role in the economies of households engaging in it. Harare has not been an exception. However, the envisaged benefits of urban agriculture should be balanced against the impact this activity has on the overall urban environment. Much as it can be argued that this is a

household survival strategy, the potential harm it has on the environment needs to be explored. Thus, it is imperative we critically analyse urban agriculture in Harare in order to come up with comprehensive actions and policies that enhance the health and safety of the urban environment and lead to the establishment of sustainable urban centres in which all inhabitants stand to benefit.

### Urban Agriculture in Harare

Harare has a history of sustainable urban agriculture which predates independence. Work carried out by Mazambani showed this trend. In 1955 some 267 ha were cultivated and this went up to 4,762 ha in 1980 (Mazambani, 1982a and 1982b: 134–138). A survey carried out by ENDA-Zimbabwe (1994) showed a dramatic increase of 92.6 percent of the open spaces area under cultivation in Harare from 1990 to 1994. The table 1 shows the changes in land under

**Table 1, Changes in Area under Urban Cultivation in Harare between 1990 and 1994**

Land use zone	Area cultivated		Actual increase (ha)	Percentage increase
	1990	1994		
Low and medium	1,588	3,376	1,788	112.6
High density	2,391	5,323	2,932	122.6
Industrial areas	843	590	(253)	(30.0)
Total	4,822	9,289	4,467	92.6

Source : Compiled by the authors

cultivation between 1990 and 1994 (Figures 1 and 2).

Since 1990 the land under cultivation in residential areas has more than doubled. The high density locations in Harare demonstrate the highest increase of 123 percent or 66 percent of the overall increase in Harare. It is important to note that for the high density suburbs sampled, they showed a density of 2,391 ha for 1990 while Mazambani's (1982a) data for 1980 was 4,762 ha. The differences could be due to the fact that 1990 data were derived mainly from photographs taken in the dry season. Thus, some vital information may have been lost.

While there has been a notable increase of area under cultivation in the residential areas, the industrial areas have experienced a significant reduction. A possible reason for this could be that industries are located away from residential areas so that cultivators have to travel long distances to such areas. Harare is estimated to cover a land area of 55,558 ha and the area under urban agriculture has risen from 8.8 percent in 1990 to 16.7 percent in 1994.

It can be seen that areas with high population concentrations such as the high density suburbs tend to have the largest area under crop cultivation. Most of the low income earners are also found in these areas. However, just a small area close to industrial sites is cultivated. This may be due to lack of surrounding open space or a restrictive long distance from the residential areas. On the other hand, there has been an upward trend in the increase of area under cultivation in the residential areas. As more people get into the activity and

Figure 1, Harare: Open space in cultivation, 1990

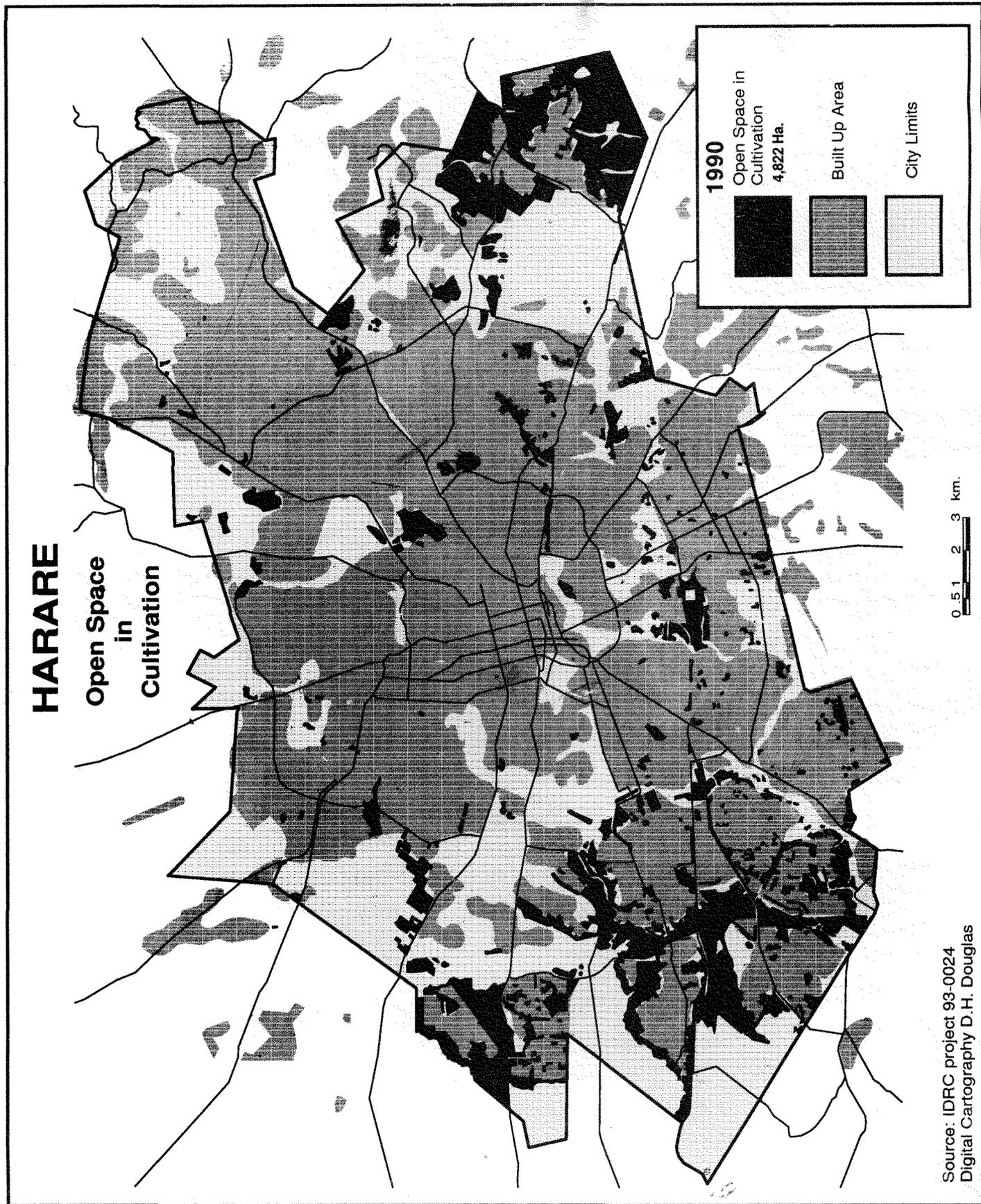
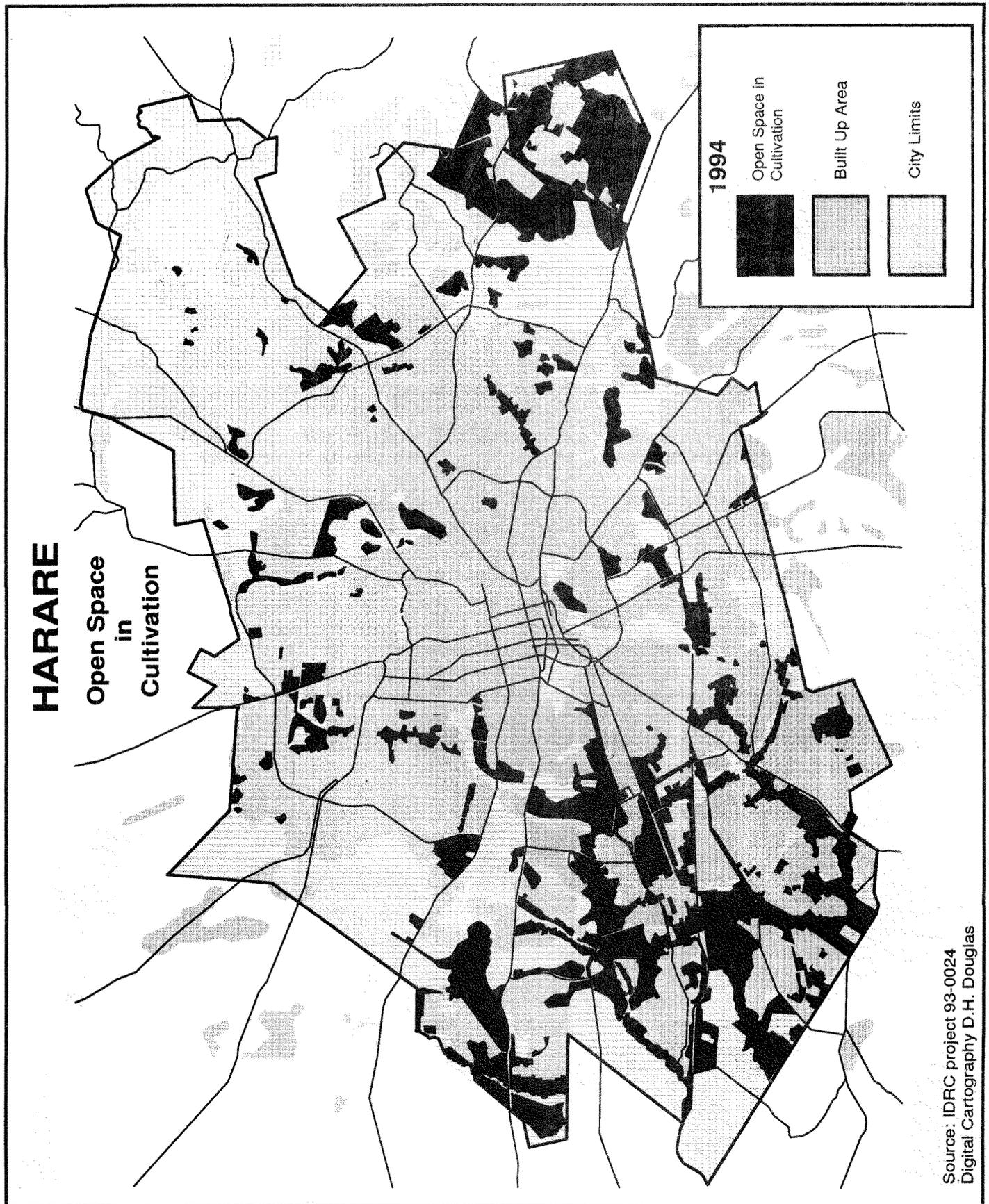


Figure 2, Harare: Open space in cultivation, 1994



the built environment continues to expand, land for cultivation will be scarce very soon. There is, therefore, need to rationalise the use of urban space.

### Nature and Character of Urban Agriculture Practitioners

The major reasons why people engage in urban agriculture is mainly economic. In Harare, this activity tends to centre on low income earners and the majority of these reside in high density suburbs as indicated in table 2.

**Table 2, Proportion of Households with Household Access to Land for Urban Agriculture by Home Ownership and Residential Density As % Sample**

Home ownership	Low density	Medium density	High density	Total
Landlords	2.6	1.8	56.6	61.0
Lodgers	1.4	0.5	25.2	27.1
Servants	2.9	0.3	1.3	4.5
Relative (of landlords)	0.6	0.2	6.6	7.4
<b>TOTAL</b>	<b>7.5</b>	<b>2.8</b>	<b>89.7</b>	<b>100.0</b>

N = 1,784

Source: Compiled by the authors

The high density areas have 89.7 percent of all urban agriculture activities and in these areas urban agriculture is carried out by landlords (homeowners), accounting for 56.6 percent of all urban agriculture activities followed by lodgers (tenants) (25.2 percent) and relatives of homeowners (6.6 percent). Homeowners dominate urban agriculture activities because of the permanence of their residence in a given area. They, therefore, are better able to establish 'permanent land claims' in open spaces for urban agriculture. Servants and lodgers who tend to change residences often reduced their access to land for urban agriculture. In the low density areas servants tend to cultivate more open spaces than their employers (homeowners) because the homeowners have relatively higher incomes and are, therefore, not into as much open space cultivation as their counterparts in high density areas.

### Location of Open-Space Fields and Extent of Cultivation

Table 3 demonstrates the type of open spaces that were under cultivation in 1994 and their specified locations.

Most of the cultivation occurs near roads and on hill slopes. It has been found that streambank, swamp and vleis cultivation is rampant in such high density suburbs as Mbare, Sunningdale, Highfield, Budiro, Mabvuku, Dzivarasekwa and Kuwadzana. This practice, if uncontrolled, imposes great risks of siltation and eutrophication. Besides land degradation

**Table 3, Land Types and Extent of Cultivation**

Location of field	Uses of spaces as %
Road sides	37
Stream banks	9
Railway line way leave	4
On hills	31
On swamps/vleis	19
<b>TOTAL</b>	<b>100</b>

Source: ENDA-Zimbabwe, 1994: 13

due to slope cultivation, the health standards of Harare residents are also likely to be affected as siltation and pollution are most likely to affect the major rivers such as the Mukuvisi, which supply water to Lake Chivero, the city's main source of water.

In all cases, open spaces indicated as being under cultivation above have their own potential negative impacts. For instance cultivating near: road/railway causes obstructions to such thoroughfares; vleis/streams leads to erosion, siltation and eutrophication of water bodies; and hillslopes and other steep slopes causes erosion. All forms of erosion from urban agriculture lead to the loss of trees and this can be harmful to the environment.

### Crops Grown by Households

As already indicated, households that are involved in urban agriculture come from all categories. Crops grown by these households vary and as shown in table 4, the main crop is maize.

**Table 4, Distribution of Households Growing Specific Crops in Off-Plot Fields by Residential Density**

Crop	Proportion growing by density			
	Low (%)	Medium (%)	High (%)	Total (%)
Maize	3.84	1.47	44.67	49.98
Groundnuts	0.81	0.03	6.76	7.60
Rice	0.03	0.69	1.11	1.83
Sweet potatoes	2.25	0.66	15.83	18.74
Sweet sorghum	0.12	0.06	4.93	5.11
Beans	0.33	0.00	4.27	4.60
Water melons	0.00	0.00	0.48	0.48
Pumpkins	0.57	0.00	9.25	9.82
Roundnuts	0.39	0.00	1.29	1.68
Cucumbers	0.00	0.00	0.15	0.15
<b>TOTAL</b>	<b>8.35</b>	<b>2.91</b>	<b>88.74</b>	<b>100.00</b>

Source: ENDA-Zimbabwe, 1994:16

Maize is the main crop grown by at least 49.98 percent of the participants. This is mainly grown by high density residents. Sweet potato cultivation comes second. These two crops form the staple food crops of most urban low-income households.

The survey also revealed that access to open spaces for crop cultivation is directly related to homeownership and or access to a house. Those who own houses have greater access to surrounding open spaces. Out of 1,784 sampled households engaged in off-plot cultivation 61 percent are landlords and most of them (56.6 percent) are in the high density suburbs. Lodgers also demonstrate a relatively higher access to off-plots (27.1 percent), whereas servants and relatives have the least access to open spaces.

Table 5 shows the participation of family members in open space cultivation. Women are the most dominant participants in open space cultivation. This is consistent with other work that depicts the dominance of women in urban agriculture.

A number of reasons explain why women dominate in urban agriculture. Most men are employed elsewhere and

**Table 5, Participation of Household Members in Off-Plot Activities by Residential Density (As a % of Households Engaged in the Activity)**

Type of participants	Suburb density			Total
	Low	Medium	High	
Mother	3.4	1.5	39.7	44.6
Daughter	0.5	0.3	12.9	13.7
Father	1.5	0.7	13.8	16.0
Son	0.2	0.2	20.4	20.8
Hired labour	0.8	0.4	3.7	4.9
<b>TOTAL</b>	<b>6.4</b>	<b>3.1</b>	<b>90.5</b>	<b>100.0</b>

N = 2,754

ENDA-Zimbabwe, 1994

cannot find time for urban agriculture. Furthermore, women have traditionally tended to be engaged in food production for household consumption. Results of the ENDA-Zimbabwe (1994) study showed that 62 percent of urban agricultural practitioners were unemployed and the bulk of them are women. This is because unemployed women have more time at their disposal and so can be engaged in urban agricultural activities. A relationship was also observed between size of household and its participation in urban agriculture. Large households with 5–9 members participated in urban agriculture most. These same households also tended to fall into the low to middle income groups. Given this background, it can be concluded that involvement in urban agriculture is basically to supplement household incomes.

Interesting enough and as if to assert the fact that urban agriculture is mainly for low income households, these data show very little use of hired labour across all areas.

### Crop Production Levels in 1994

Table 6 demonstrates that many urban households rely more on maize cultivation for family consumption requirements. Survey results show that only 15 percent of maize harvested was sold in 1993. Maize sales are expected to have increased in the subsequent years by at least 5 percent per annum. As participants realise the accrued income benefits, it is most likely that they intensify their activity in order to gain more.

The estimated total harvested crops emphasise the greater reliance of urban households on such crops as maize, sweet potatoes, beans and groundnuts for food security, income and cash saving, especially in the high density areas. All the

statistical information points to the need to accept and promote food production as a critical urban function. Official support of urban food production would ensure cheap supplies of sufficient and nutritious food for the majority of the urban poor.

### The Practice of Open Space Cultivation and Its Impact on the Urban Environment

#### (a) Technology and Inputs

Open space cultivation in Harare is largely done by the use of hand tools (hoes). ENDA-Zimbabwe (1994) survey results show that 20 percent of the sampled households use fires for land preparation. The use of fire has adverse effects on the urban environment and in particular it destroys organic matter and this reduces soil fertility. Besides the risk of spreading to other land-use zones and air pollution, fire destroys the vegetation and exposes the soil to erosion. However, destruction of the vegetation results in potash (fertiliser) needed to improve soil fertility.

Of the sampled practitioners 88.4 percent use chemical fertilisers, 2.1 percent organic fertilisers and 9.5 percent use both. Most Harare open space cultivators prefer the use of chemical fertilisers over compost to boost production levels. Furthermore, 2.04 percent of the sample use pesticides. Dimethoate and some powders (Malathion dust) are the main pesticides applied. These fertilisers and pesticides have significant impact on the urban environment, especially the water bodies. It is important that institutions and policy-makers take due regard of these inputs in creating an enabling environment that supports the livelihood of the urban households and the safety and health of the city's residents at large.

On the other hand, it has been shown that open space cultivation occurs on hill slopes, road and rail reserves, swamps and stream banks. Most of these cultivated areas do not have any mechanical conservation measures to control soil erosion. As most of the cultivated crops take very long to provide an adequate soil cover, erosion is inevitable.

#### (b) Access to Land for Cultivation

All forms of open space cultivation in Harare may be viewed as illegal as there are no clear (if any) statutory provisions that legalise the activity. Consequently, there are no formal means by which land is allocated to selected

**Table 6, Estimated Total Harvested Crops Across the Three Residential Sectors for the 1994 Harvest Season**

Major crops	High density		Medium density		Low density	
	Produced/Consumed	Produced/Consumed	Produced/Consumed	Produced/Consumed	Produced/Consumed	Produced/Consumed
Maize	3,994.7	2,557.8	46	46	383.1	128.3
Roundnuts	291.8	291.8	–	–	0.2	0.2
Groundnuts	103.5	80.1	–	–	16.4	7
Rice	17.3	16.3	–	–	1	1
S/potatoes (buckets)	533.9	408.6	2	2	43.7	16.7
Beans	777.9	777.9	–	–	7.4	7.4

Source: Compiled by the authors

individuals. Land acquisition is mainly by survival of the fittest. Under these circumstances, cultivators are not guaranteed access to the same piece of land in successive seasons.

Even though some local authorities have 'informally' allocated cultivation land (which may be due to intense pressure by urban households to engage in the activity), security of tenure is not guaranteed to the cultivators as there are no legal contracts specifying their tenure with the local authorities. An insecure land tenure system does not provide sufficient incentives for the cultivators to invest in conservation and other land protection structures.

Faced with such a situation, what then can be done to the practice of off-plot cultivation in Harare in order to sustain the economy of the city at large?

### Conclusion

Policy-makers and urban planners should formulate strategies that are geared towards sustainable economic development of urban centres. A holistic approach has to be adopted, which looks at the locational and functional dimension of open space cultivation both as a land use and within the context of the urban economy. This should be substantiated with necessary legislation changes, particularly the Regional, Town and Country Planning Act of 1976 and allied Acts which have colonial undertones and are generally hostile to urban informal sector activities (particularly land-use activities deviating from rigid plans). This is mainly due to the fact that urban agriculture is a reality. Although forbidden, urban agriculture will continue. It is interesting to note that 76 percent of urban agriculturalists interviewed were knowledgeable and aware of Council bylaws. These bylaws are not likely to abide within the present circumstances.

Urban agriculture in Harare is here to stay because of the important role that it continues to play in the urban household economy in the face of worsening economic hardships. Yet in Harare, it takes many years between land acquisition, servicing and ultimate construction. With appropriate planning, such land could legally be made available for urban agriculture during the period between acquisition and construction. After all, it will still be cultivated illegally, exposing it to possible degradation which could make final construction expensive.

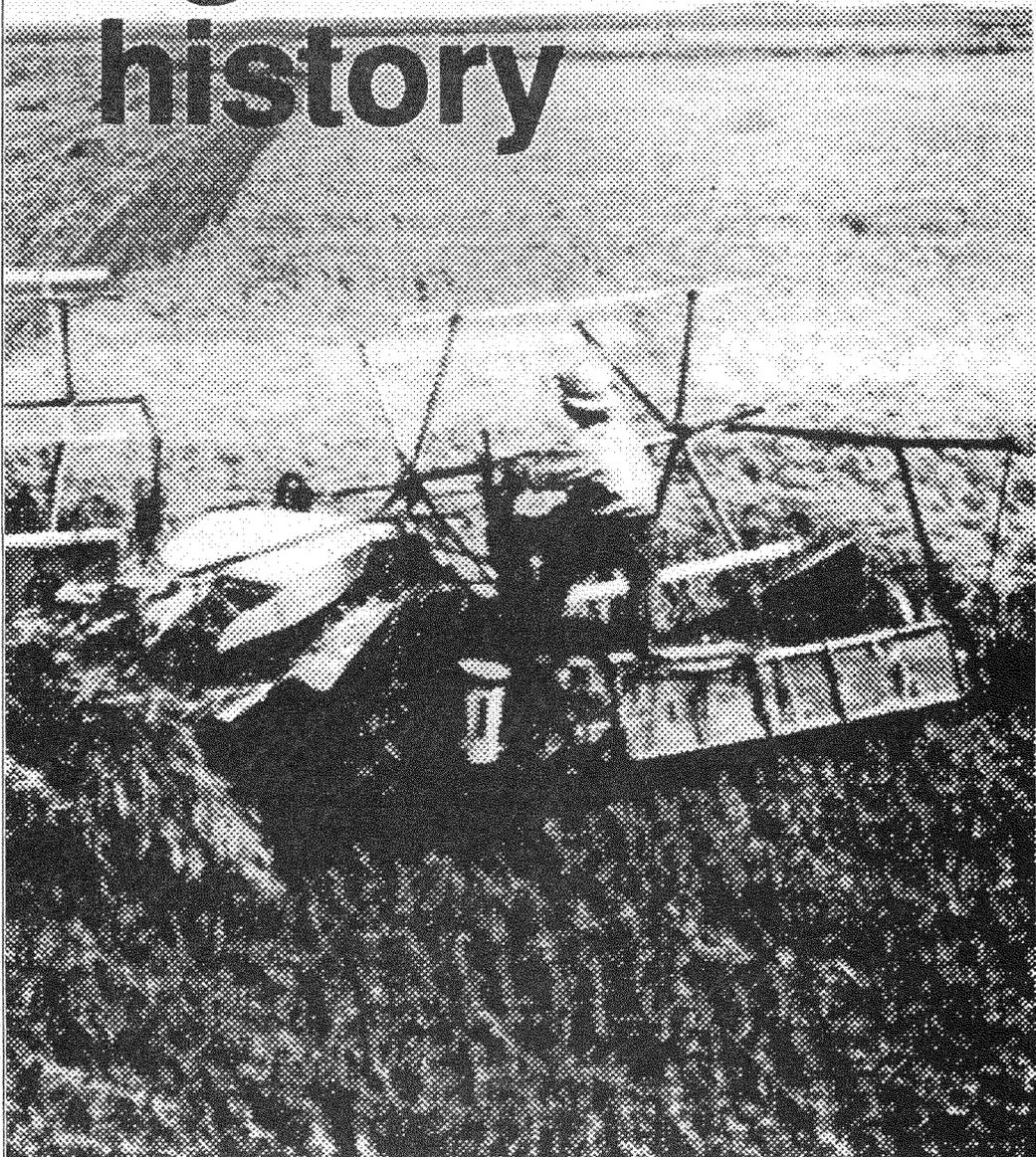
The significance and prospects of urban agriculture have been narrated and a number of recommendations have been drawn. What remains is the role politicians and planners should play to ensure the provision and promotion of sustainable agricultural practices into urban land-use plans. There is need for central and local government authorities to create an enabling legislation that supports urban agriculture. This will ensure urban planning policies that are

accommodative and supportive. Planning authorities should incorporate urban agriculture as a land-use activity that needs to be planned for and managed like any other land-use activity. Planners must consider the drafting of a cultivator's lease with the minimum conditions set to ensure sustainability and environmental protection. The granting of the lease will give urban agriculture practitioners a sense of security of tenure and this will ensure the future of urban agriculture within the urban economy in terms of productivity. Legalising urban agriculture could pave the way for the provision of support services, including extension and training services and credit facilities through the relevant institutions. To revitalise urban economies, urban agriculture should be commercialised to ensure that it becomes labour dynamic. This could help to lower the increasing levels of unemployment that has become part and parcel of the Zimbabwean economy. Once urban agriculture takes shape within the urban economy, there is need to set up a multidisciplinary environmental impact monitoring committee which will be responsible for monitoring and evaluating urban agricultural activities. As the City of Harare continues to grow and the country's economic problems continue, it is highly unlikely that urban agriculture can be halted by mere policy pronouncements. A deliberate policy of supporting it will be essential so that it becomes environmentally friendly.

### References

- ENDA-Zimbabwe (1994). *Urban Agriculture in Zimbabwe and Its Impact on the Environment: A Survey of the City of Harare*. Harare: ENDA-Zimbabwe.
- Mazambani D. (1982a). "Aspects of Peri-Urban Cultivation and Deforestation Around Salisbury 1955-1981". Harare: MA Thesis, Geography Department. University of Zimbabwe.
- Mazambani, D. (1982b). "Peri-Urban Cultivation in Greater Harare", *The Zimbabwe Science News* Vol. 16 No. 6.
- Mosha A.C. (1991). "Urban Farming Practices in Tanzania". *Review of Rural and Urban Planning in Southern and Eastern Africa*.
- Smit J. and J. Nasr (1992). "Urban Agriculture for Sustainable Cities: Using Wastes and Idle Land and Water Bodies as Resources", *Environment and Urbanisation* Vol. 4 No. 2.
- van der Blik J. (1992). *Urban Agriculture—Possibilities for Ecological Agriculture in Urban Environments as a Strategy for Sustainable Cities*. Leusden, Netherlands: ETC Foundation.

# agricultural history



Subscriptions: \$25.00 for individuals; \$43.00 for institutions;  
\$15.00 for students. (Add \$5.00 postage for foreign orders.)

**University of California Press**

2120 Berkeley Way, Berkeley, CA 94720

**Editor: Morton Rothstein,**

Agricultural History Center University of California,  
Davis, CA 95616

## ANIMAL FARMING IN AFRICAN CITIES

**Ann Waters-Bayer**

ETC Foundation, P. O. Box 64, NL-3830 AB Leusden, Netherlands

Address for correspondence: Rohnsweg 56, D-37085 Göttingen, Germany; Tel: +49-551-485751, Fax: +49-551-47948

Email: wb.waters@LINK-GOE.zerberus.de

### Abstract

Accepted September, 1995

*In this article, attention is drawn to the importance and recent growth of livestock rearing inside African urban centres. Ways of classifying the existing production systems are suggested. The functions of animal farming for different income groups and the opportunities that livestock rearing offers for urban economies are outlined. Problems caused by the keeping of livestock in the urban centre and major constraints faced by the livestock rearers are discussed. Finally, proposals are made for research and development action to address these constraints and to grasp the opportunities offered by animal farming in urban centres, particularly with respect to recycling of urban wastes.*

### Résumé

*Cet article confirme l'importance et la croissance récente de l'élevage de détail dans les villes africaines. On propose des alternatives de catégorisation pour les systèmes de production courants. L'auteur note les fonctions que l'activité remplit auprès des producteurs, lesquelles varient selon leur niveau de revenus, ainsi que les opportunités qui s'offrent aux villes pour accroître l'apport de l'élevage urbain à leur économie. On y propose enfin des lignes de recherche et d'action pour le développement, nécessaires à la résolution de contraintes et à l'optimisation d'opportunités identifiées, notamment au niveau du recyclage des déchets urbains.*

### Background

Keeping animals in urban centres is not a recent phenomenon. Throughout history, urban dwellers in both northern and southern countries have depended on their livestock for security and survival, especially during periods of political unrest. During wars in previous centuries, people sought safety for themselves and their animals behind urban centre walls, such as in Kano in northern Nigeria. But also in the decades since independence, as immigrants have set up satellite settlements beyond the old walls of the urban centres and as urban growth has engulfed the surrounding villages, the open spaces between the many quarters which make up most African urban centres are commonly used for livestock rearing (figure 1).

In less than 20 years, the urban population in developing countries will have doubled, at current growth rates (Carty, 1991: 2–4). Worldwide, urban dwellers will outnumber rural dwellers by the year 2000 (Sachs, 1986: 2–11). Many urban planners—and also many livestock development planners—regard urban livestock keeping as a transitory phenomenon in developing countries. However, there is no sign that livestock and other forms of farming decrease when urban centres grow larger and people reside longer in the urban centres. Indeed, studies in Africa suggest quite the contrary (e.g. Sawio, 1993).

In the colonial period, livestock were banned from most urban centres in Africa. After independence, the bans were usually retained, while government support was given to

'modern' production of meat, milk and eggs by transnational or domestically-owned companies located on the outskirts of large urban centres. Government incentives included tax exemption, low-interest credit, subsidies on inputs and/or outputs, liberal policy concerning imports of equipment, machinery, exotic breeding stock and feeds. Technical assistance of donor countries and sales efforts of agroindustries were geared to these high-input systems (Krostitz, 1984: 17–23).

Recent economic changes have put these systems under considerable pressure. Large-scale intensive livestock production in periurban areas is declining in many countries which are struggling with Structural Adjustment Programmes, especially after devaluation in the francophone countries of Africa. The costs of imported inputs have skyrocketed and the luxury urban markets served by the 'modern' enterprises have dwindled as a result of recession. Consumers are buying products from livestock reared on low-cost local resources and sold through unofficial channels, often directly from producer to consumer rather than buying the more expensive products from dairy plants or certified butchers.

In the meantime, despite government bans, livestock rearing in the urban centres is being developed by micro-entrepreneurs through processes of indigenous development, without external support. With rapid urbanisation and deterioration of economic conditions, a growing number of urban families are raising small animals such as poultry, goats, sheep, pigs and rabbits. Some also keep a few dairy cattle.

---

*Acknowledgements*—The author thanks Jean Michel Centres, Groupe de Recherche et d'Échange Technologiques (GRET), France; Davison Gumbo, Environment and Development Activities Zimbabwe (ENDA-Zimbabwe); Luc Mougeot, International Development Research Centre (IDRC), Canada; and Jac Smit, The Urban Agriculture Network, USA, for generously making reports and information available for this review; and Wolfgang Bayer and Gerrit Zemelink for their constructive comments on the text.

---

Figure 1, Sites of peri-, inter- and intra-urban livestock rearing in a typical African city

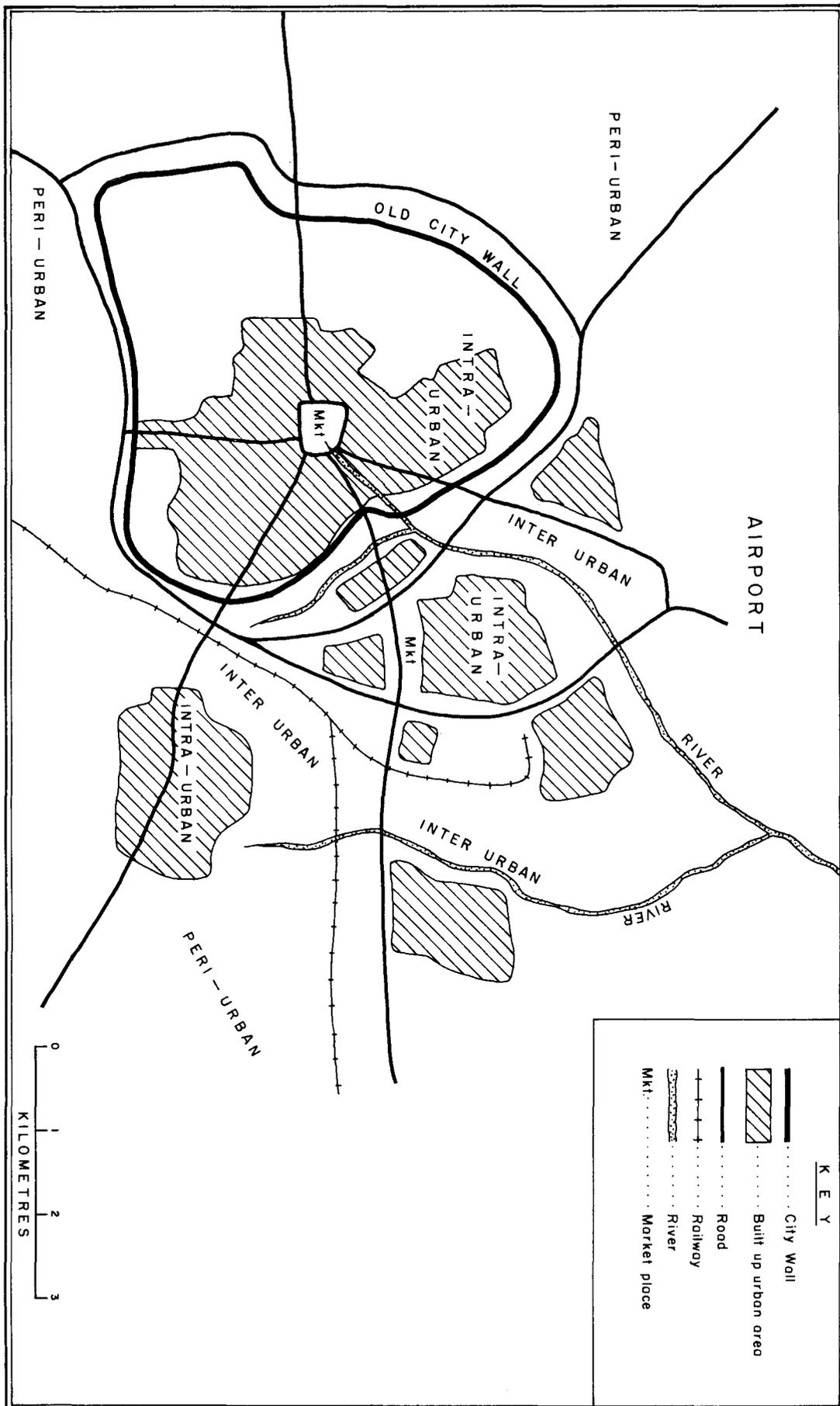


Fig. 1 : SITES OF PERI-URBAN, INTER-URBAN AND INTRA-URBAN LIVESTOCK REARING IN A TYPICAL AFRICAN CITY.

Development agencies and government officials are only beginning to recognise what is happening, even though they themselves may live in the same urban centre.

### Growth in Livestock Numbers

Only in recent years has urban agriculture received much attention from research and the focus has been on crop rather than animal farming. Animals in African urban centres have been largely overlooked not only because they are not supposed to be there but also because they are mobile, they use land only temporarily and, especially in the case of small animals kept in the home or backyard, they are not readily visible. Therefore, only few research data are available. However, these data already indicate considerable growth in livestock numbers in African urban centres in recent years.

In Dar es Salaam, Tanzania for example, the chicken population increased from about 500,000 birds in 1985 to 800,000 in 1989 while the number of pigs, goats and dairy cattle doubled (Mougeot, 1994). Yet the fresh milk processed by the parastatal Tanzania Dairy Limited plunged from more than 14 million litres in 1979 to less than 5 million litres in 1989 (Ngigwana, 1992: 115–122). Likewise, small-scale dairy production is increasing in and around Nigerian urban centres, but less than 10 percent of the milk enters official market channels (Walshe et al., 1991). Also in Addis Ababa, it was found that most dairy producers are selling directly to individual consumers (Debrah, 1992: 257–268). The informal trade in unprocessed milk in Nairobi, Kenya has also increased in the last few years (Staal and Shapiro, 1994: 533–549). The informal sector of animal farming and marketing of animal produce in major African urban centres is flourishing. Other quantitative studies made in African cities have revealed that more than 20,000 households in Bamako rear animals in the city, and thousands more derive income from supplying them with production inputs or marketing services (Centres, 1991); over one-third of households surveyed in Harare rear animals in the city, mainly chickens but also rabbits, pigeons, ducks and turkeys (ENDA-Zimbabwe, 1994); 51 percent of households in six major Kenyan urban centres own livestock and 17 percent keep them in urban centres (Lee-Smith and Memon, 1994: 67–84); official 1990 records for Nairobi show about 25,000 cattle, 30,000 small ruminants, 30,000 pigs, 8,500 rabbits and 350,000 poultry (van der Blik, 1992); in Dar es Salaam, urban farming is the second largest source of employment after petty trade and labour, and 74 percent of urban farmers keep animals (Mougeot, 1994); and even in very densely populated Cairo, Egypt 5 percent of the households rear animals, especially chickens and pigeons; about 15 percent of eggs consumed in the city are home-produced (Khouri-Dagher, 1987). These data are either official statistics or the information that researchers could obtain from urban dwellers who may not have dared to be fully open about their (officially illegal) activities. The number of animals actually kept in these African urban centres is probably much higher.

### Classification of Livestock Systems

The livestock production units best known to people working in government services are those which make most

demands on their services: the **peri-urban** commercial enterprises of large to medium size situated on the edge of urban centres, operated by the government, parastatal organisations or private firms and specialised in poultry, egg, beef, pork or dairy production.

The formal livestock services generally have very little knowledge of the small-scale animal farming activities inside urban centre quarters (**intra-urban** or core-area livestock rearing) and between quarters of the same urban centre (**inter-urban** or corridor livestock rearing). People who raise animals in the urban centre can be roughly divided into 'on-plot' livestock rearers who use private residential space in backyards, inside the home, or on balconies or rooftops inside the residential areas of the urban centre; and 'off-plot' livestock rearers who use unoccupied private or state land such as unbuilt plots, hospital or school grounds, public parks, wetlands and streamsides unsuitable for building and strips along transport and utilities (telephone, electricity) lines, often in the corridors between the residential areas.

#### (a) On-Plot

Livestock kept on-plot are often enclosed by a fence, wall or cage or are tethered and feed and water are brought to them. Larger animals may be allowed to graze part of the day, at least seasonally. Besides homeowners, also employees living on institutional compounds such as hospitals and schools keep animals at their place of residence. For example, 81 percent of staff living on the university campus in Zaria in northern Nigeria keep livestock there, mainly poultry and small ruminants (Gefu, 1992: 295–302). A particularly widespread system of on-plot animal farming is practised in West and North African urban centres, where stall-kept or tethered sheep are fattened for Muslim festivals. These are very labour-intensive production systems using high quantities of local, usually purchased, feed. They are, nevertheless, profitable on account of the extremely high prices for fattened rams (Centres, 1991).

#### (b) Off-Plot

Livestock kept off-plot tend to be grazing animals such as sheep, goats, pigs, cattle, buffalo and donkeys. They are herded, tethered, hobbled or allowed to roam freely on land which is used with or without the landowner's consent. Some herds are brought in by pastoralists from outside the urban centre in order to graze the urban lowlands during the dry season (Mbiba, 1994: 22–25). Many of the off-plot grazing animals belong to landless families: either long-term squatters in densely-populated slum settlements, or pastoralists who settle temporarily on vacant land on the outskirts of urban centres or beside traffic routes in the urban centre.

In some cases, people with only a few animals each jointly hire a herder to care for their animals. This is done, for example, by some dairy-cattle owners in Bamako. The animals are kept together also at night: the corrals are within the urban centre limits on sites which are designated by the authorities and can be shifted as demand for housing grows. In addition to daily grazing, the animals are fed very limited supplements bought by the owners (Achuonjei and Debrah 1992: 223–238).

In urban centres in northern and central Nigeria, off-plot dairy production is practised by family units operating independently from each other: either settled Fulani pastoralists with small herds or more mobile Fulani who keep only their milking cows in the urban centre. The cows are grazed on unoccupied land in and near an urban centre and are fed some purchased supplements such as groundnut cakes and crop residues. The Fulani women process the milk into fermented products and butter and sell directly to consumers. The manure is sold as fertiliser to nearby gardeners and farmers. In the case of the Fulani who keep only the milking cows in the urban centre, the men take the rest of the herd to graze further afield, where they set up a second temporary camp. A similar system, involving small dairy herds of about five cows each is reported from Mogadishu, Somalia (Giorgetti et al., 1983: 372–380). Thus, the relatively scarce feed and space inside the urban centre are used for the most productive animals.

The above classification of urban livestock systems is made primarily according to location: periurban versus urban, on-plot versus off-plot. There are various other possibilities of classification such as according to main production aim: commercial, semicommercial, subsistence; scale of production: large, medium, small, micro; intensity of production: high, medium or low level of external inputs; relative importance as economic activity: full-time vs part-time; labour resources: individual or family vs hired; animal resources: indigenous, crossbred, exotic; husbandry methods: free-roaming, herding, tethering, stallfeeding or a combination of these; knowledge base of producer: experienced vs inexperienced; origin of producer: indigene vs immigrant, ethnic and/or religious group and land tenure: private, usufruct rent or lease, informal agreement, unsanctioned. In any given setting, the classification most useful for understanding the existing systems and guiding development planning will depend on the historical development, the settlement patterns and the major resource constraints. For example, if space is a major constraint for livestock rearing in an urban centre, then classification of systems according to scale and husbandry methods will help in designing appropriate action.

### Functions for Different Income Groups

Urban livestock systems could also be classified according to the income level of the entire household, i.e. not only the income from livestock. Studies have revealed that small-scale farming including animal farming is practised by urban households in all income groups (e.g. Sawio, 1993; Maxwell and Zziwa, 1992 and Mougeot, 1994). However, some types of animal farming are more widely practised by the relatively rich and others by the relatively poor. It is important to distinguish between these if development is supposed to be aimed at alleviating poverty, as the functions of livestock and the strategies for improving the production systems will differ.

#### (a) For the Rich

Periurban 'modern' poultry, pig and dairy units are owned by the relatively rich and generally cater to a high-income

market: expatriates, supermarkets and restaurants. Likewise, individuals raising large ruminants in urban residential compounds are middle- and high-income earners (Centres, 1991; Mbiba, 1993; Egziabher, 1994: 85–104; ENDA-Zimbabwe, 1994; Lee-Smith and Memon, 1994: 67–84 and Sawio, 1994: 25–46). Two-thirds of all animals kept in Dar es Salaam are found in the large gardens in formerly colonial, now elitist African residential areas (Mougeot, 1994).

Particularly businessmen and civil servants, active or retired, have diversified into livestock rearing. They depend wholly or partly on hired labour. Many are inexperienced in animal husbandry as may be their employees as well. The animals are fed mainly with purchased roughage and concentrates: crop residues and agroindustrial by-products such as brewery waste. These are the private producers who take advantage of extension and veterinary services. Their social links also give them access to exotic breeds, either imported or obtained from large state farms (Laurent and Centres, 1990; Centres, 1991 and 1992; Achuonjei and Debrah, 1992: 223–238 and Nell, 1992: 31–44).

Much more experienced are the on-plot livestock rearers in urban centres with a long tradition of urban farming. For example, large and fairly well-off Hausa families in northern Nigerian urban centres keep cattle in the inner courtyards of their homes. The animals are fed with grass and crop residues, which are either purchased or fetched by workers. The milk is consumed mainly by the large family. The manure is packed in sacks and transported by donkeys to the family farmplots. This was described already by the German travellers Barth and Staudinger in the 19th century and is even more widespread today (Fricke, 1979).

In some cases, these animal-farming activities of the better-off urban dwellers are intended as a source of highly-valued food and as a source of supplementary income (although economists' calculations often cast doubt on the profitability). In other cases, they are more of a hobby than a business. In urban as in rural areas, livestock also play a social role for family and religious ceremonies. However, especially in recent years as the gap widens between real wages and the costs of urban life, an important reason why employees in the formal urban sector raise animals is to reduce food expenditures (Maxwell and Zziwa, 1992 and Mlozi et al., 1992: 284–294).

#### (b) For the Poor

Off-plot livestock rearing such as along roadsides appears to be mainly an activity of lower-income groups. On-plot animal rearing by poorer urban dwellers is largely restricted to micro livestock such as poultry, rabbits and guinea pigs, and a few small ruminants. A large number of low-income urban farmers many of whom rear smallstock are women (Maxwell and Zziwa, 1992; ENDA-Zimbabwe, 1994; Lee-Smith and Memon, 1994: 67–84 and Sawio, 1994: 24–46). These producers have little access to veterinary care and can afford only very limited amounts of purchased feeds. Very poor urban dwellers sift through garbage to find food for their smallstock; they can also be observed spreading out garbage piled on urban streets to let their goats select from it.

Many of the poorest households, especially recent migrants to squatter quarters, would like to have livestock, but cannot because they do not have enough money, space, security and knowledge of local possibilities to start. Especially for the lower-income urban families, livestock rearing plays a vital role as a source of food, income and security. For them, the main functions of livestock are to provide animal protein for the family which it could not afford to buy; generate some income through sales of animals, milk, manure and/or transport services; serve as a buffer against high rates of inflation; save capital in a form that provides higher interest rates (offspring) than money in the bank and that can be used as a reserve to cover unexpected expenses; provide additional employment opportunities for family members, especially those without formal training; make productive use of 'free' resources such as kitchen wastewater, food-processing residues, and garbage in city streets; and transport, water, feed, food and trading goods in the case of donkeys, for example.

Urban animal farming provides a source of employment not only for the livestock rearers themselves but also for people operating in the informal supply systems: herders, watchmen, collectors and sellers of milk, eggs and birds, and sellers of leaves and grasses (Centres, 1991). Some poorer women also go from house to house to buy cereal bran which they then resell to livestock rearers in the urban centre. On urban markets and roadsides, bundles of cut grass or lopped browse, groundnut hay and other crop residues are offered for sale. This is done not only by farmers but also by poor urban dwellers, who make daily forays several kilometres out of the urban centre in order to collect feed to sell in the urban centre (Centres, 1991). Some farmers without animals even grow forage for sale, such as those who grow Napier grass around Nairobi to sell to urban livestock rearers (Lado, 1990: 257–266).

### Opportunities for the Urban Centre

Animal farming serves useful functions not only for the producers; it also offers the urban centre as a whole several opportunities to make better use of its resources. Public benefits offered by keeping livestock in cities include: bringing a return from land which is unsuitable for construction (e.g. seasonally flooded areas), still undeveloped or not being used for other purposes (e.g. land foreseen for airport expansion), or suitable for multiple use (e.g. urban woodland); providing employment, also upstream (input supply) and downstream (processing and marketing); reducing transport and energy costs (and associated pollution) for input supply and produce marketing, as distances between producers and consumers are short; reducing public expenditures for municipal services or land maintenance, e.g. for garbage collection, or for cutting vegetation along roadsides and utility lines and on other public land; improving the supply of fresh, perishable foods such as milk and eggs to urban consumers, especially those who lack refrigeration facilities and providing urban dwellers with food more cheaply than imported food, as producers can sell directly to consumers, and the costs of processing, packaging and handling are reduced.

One of the greatest strengths of small-scale urban livestock rearing is its great mobility and flexibility. Animals can be moved from one day to the next; field crops and trees cannot. Livestock rearing gives value to municipal and private land momentarily not being used for other purposes, thus making 'opportunistic' use of land in a positive sense.

A key opportunity offered by urban livestock rearing is waste recycling. One of the biggest problems in urban centres—garbage—can be a resource for animals: organic wastes from households, streets, marketplaces and agroindustries can provide valuable feed for animals. Removal of these wastes for use in animal farming can at least partly replace municipal garbage-disposal services. The value of recycled wastes for livestock has long been recognised in Asian urban centres, but also in many large Latin American urban centres, where a lucrative source of income for smallholders is backyard pig keeping based on household scraps and food wastes from restaurants. In Montevideo, people with horse carts collect garbage useful for pig feeding before the garbage trucks come (Seré and Neidhardt, 1994: 10–14).

Also urban wastewater can be a resource for urban animals and crops. For example, Mexico City, Mexico pumps over half its sewage to irrigated alfalfa fields. The feed is trucked to the urban centre and sold in shops to backyard livestock producers who, in turn, sell the manure to urban growers of vegetables and flowers (Smit and Nasr, 1992: 141–152). On the outskirts of Harare, the City Council grazes cattle on pastures irrigated with treated wastewater and sells the meat to urban market outlets (Mougeot, 1994). Some herders in Zimbabwe have taken wastewater management into their own hands: they are blocking sewer mains passing through low-lying land between residential quarters of the city so as to flood the area and provide green pasture for their cattle (Mbiba, 1994: 22–23).

Another use of wastewater is aquaculture, a fast-growing form of urban livestock rearing throughout the world. Fish can be raised in wastewater purified less completely than needed for direct human consumption. The water can be purified by biological means such as duckweed, which can also be used as feed for fish and other livestock (Smit and Nasr, 1992: 141–152).

Just as urban wastes can be a resource for livestock, the wastes from urban livestock can be a resource for cultivation and also a source of income for livestock owners. Thus, a potential problem of animal farming—manure accumulation—is turned into a valuable input for urban production of staple foods, vegetables and fruits. Indeed, it is reported from Indonesia that manure mixed with rejected feed and sold as fertiliser can make up a large part of the cash generated from small ruminants kept in stalls (Orskov, 1994:24). The rapid recycling of animal wastes helps reduce the health risks caused by keeping livestock in the urban centres. Informal systems are being developed to transfer manure and animal-processing wastes to nearby cropland and fishponds. In Bamako, for example, market gardeners buy animal manure which is carried to school by the children of livestock rearers; the gardeners also fetch slaughterhouse wastes to fertilise their plots (Centres, 1991). Women, who

keep the majority of small ruminants in northern Nigerian urban centres, also benefit from selling the manure to local gardeners (Hill, 1972).

Efficient recycling of sewage water and organic wastes for and from livestock will be a main focus of research and extension work in urban animal farming. Appropriate forms of local organisation are needed to strengthen the links between livestock, cropping, food processing and waste collection. Household separation of garbage and decentralised collection of the organic wastes for urban livestock and crops within different urban centres quarters should be encouraged by emphasising the economic benefits (Lardinois and van de Klundert, 1994: 6–8). There are already some promising examples, particularly in large Asian urban centres, of how such local recycling of nutrients can make urban centres more self-sustainable in terms of food security (Newcombe, 1977: 179–208; Smit and Nasr, 1992: 141–152). A notable initiative in Africa is that of the Zabbaleen community, which specialises in collecting, sorting and recycling solid wastes in Cairo, Egypt. The livestock keepers graze their pigs and goats on organic wastes and, in turn, supply the community's composting plant with livestock wastes (Mougeot, personal communication, 1995).

### Problems and Constraints

Raising animals in urban centres brings not only benefits; it can also give rise to very real problems. When the density of animal population is high, diseases can spread more easily and quickly. The proximity of animals to humans increases the risk of transmitting diseases also to humans. Manure, dirty bedding materials, feed rests and the wastes of animal processing, if not properly handled, can attract flies and rats and can pollute water. As products of urban livestock are sold mainly through informal channels, control of hygienic conditions and food quality becomes impossible. It is already extremely difficult in the formal sector, in view of the lack of appropriately equipped laboratories and qualified staff in many African countries. Traffic accidents are caused by roaming animals. Neighbours often complain about the noise and odours from animals kept in the urban centres.

Banning animal farming and sales of non-controlled animal products is not the answer, as this would deprive many urban families of a vital source of livelihood and security. Besides, in many urban centres, the bans are already in the books, but cannot be imposed. Most importantly, bans prevent government services from intervening to improve animal health and productivity and to minimise risks to human health.

It is in the interest of the large-scale periurban livestock operations, which have high overheads and high production costs, to eliminate the competition from the small-scale urban livestock rearers who can offer cheaper products with less processing and packaging. Before governments succumb to the pressures of the influential 'modern' producers for stricter controls on production and marketing, a closer look needs to be taken at who will benefit from such controls. The health arguments were put forward in colonial times to justify bans and possibly to eliminate indigenous competition; the same arguments are still widely used today.

An important task of researchers will be to determine the real impact of urban animal farming and informal sale of animal products on human health and to compare this with the benefits. For example, with regard to milk, what is the occurrence of brucellosis (and in turn, Malta or undulant fever in man) and tuberculosis among consumers of the milk products sold through informal channels as compared with that among consumers of industrially-processed milk? What would be the impact on nutrition and, thus, health if banning the sales of unpasteurised milk and introducing expensive processing meant that poorer segments of the population could no longer afford milk? To what extent do local traditions of preparing foods derived from livestock (e.g. fermentation of milk, lengthy cooking of meat) reduce the risks to consumers? Rather than repeating the suspicions of potential health risks caused by urban animal rearing, scientists should be carrying out interdisciplinary, including epidemiological, studies to provide evidence of the problems in health and other sectors affected by livestock rearing. Then, attention can be given to solving the most serious real problems of high priority for human welfare.

The reality of today is that millions of people in African urban centres are living with livestock, either their own or that of their neighbours. The people have good reasons for keeping animals and they face considerable problems in doing so. They, their neighbours and their customers could benefit greatly from support in dealing with these problems.

The few detailed studies made thus far suggest that a major problem experienced by animal farmers in the urban centres is the high rate of livestock mortality. For example, the value of animals that died annually was found to be higher than the value of animals consumed or sold by urban cattle rearers in Nairobi (Lee-Smith and Memon, 1994: 67–84). Also a study of urban sheep production in Côte d'Ivoire came to the conclusion that productivity could be increased most efficiently by reducing mortality (Armbruster, 1987).

The challenge for livestock services is to find economic ways of doing this. Most small-scale animal farmers cannot afford large cash expenditures. The solutions are more likely to be found in the realms of cost-effective prophylaxis rather than curative measures and in hygiene education rather than regulations that cannot be enforced.

But animal farmers' problems are by no means limited to those of animal health and hygiene. Studies of urban livestock rearing in Mali and Burkina Faso revealed that the greatest problem of small-scale producers is obtaining sufficient feed, particularly in cramped inner sectors of urban centres where there is little or no room for grazing. This problem is likely to be closely linked with the high animal mortality rates. Another problem in the inner urban centres is lack of adequate space for the animals. When it rains, small ruminants and poultry are kept in the entrance, the kitchen or a room of the house; otherwise, they wander the streets. Addressing these problems of animal feeding and housing will help in improving animal welfare and reducing losses. It may also be possible to overcome space constraints by promoting a shift to smaller species of animals.

Where producers are so close to consumers, marketing does not appear to be a major problem. In the studies done in

urban centres such as Bamako and Bobo Dioulasso, the need for better organisation of input supply was deemed to be far more important than improving the organisation of marketing (Centres, 1991 and 1992).

### Room for Action

As the urban centres expand rapidly and as increasing numbers of urban dwellers seek security and profit in raising crops and animals, governments have to re-examine their position with respect to urban agriculture. In view of the potential dangers of livestock being kept in close proximity to humans, but also in view of the potential benefits offered by keeping animals on the urban centre doorsteps, development planners are faced with many challenges.

#### (a) Recognition

The first big step for public authorities is to recognise that animal farming in African urban centres does exist. Official recognition makes it easier for veterinary and extension services to deal with the potential dangers of livestock to public health and environmental quality.

#### (b) Information

Needs to be disseminated to both producers and consumers about livestock-related dangers for human health and how to avoid or reduce them.

#### (c) Action-Oriented Research

To obtain relevant information and to ensure proper assessment of the potentials and problems of urban animal farming, more research is needed into the existing livestock-rearing systems in African urban centres. The research must be designed to yield the kind of information that urban farmers, consumers and planners require for making decisions and taking action and the results of such research need to be made widely known among all stakeholders in clear and concise language. Above all, action-oriented research in urban animal farming should be aimed at building the capacities of the poor and landless urban dwellers to assess and expand their possibilities to use urban centre resources to rear livestock and to argue their interests in the political arena of the urban centre.

#### (d) Appropriate Technology and Inputs

Development agents should work together with low-income urban dwellers to develop appropriate technologies for rearing animals in small spaces as well as organisational forms to give poor urban dwellers access to the inputs necessary for healthy and productive forms of animal farming. A relatively simple start would be to make inputs such as veterinary products and feed supplements available in small units suitable for backyard farming. As emphasised above, there is particular need for innovations in technology and local-level organisation to permit efficient and safe recycling of organic wastes for and from livestock in the urban centres. Innovative ways of combining animal farming and 'greening' of the urban centres should also be sought. Urban livestock keepers may even invest in urban environmental improvement

if they can derive benefits from it. For example, they could be granted rights to grow and trim trees which line the roads or to plant and cut grass on unbuilt slopes or public land, in order to obtain animal feed.

#### (e) Policy Favouring Small-Scale Low-External-Input Systems

Governments need to set up a policy framework which favours small-scale animal farming based on inputs available in and near the urban centres. This would involve encouraging the use of local and so-called 'non-conventional' feeds and taking advantage of the wastes from urban agroindustries such as breweries. This would also involve focusing on animal species and breeds which can use the available roughages and depend less on concentrates and which are suitable for urban areas because of their small size and docile nature. As a rule, it can be said that the smaller the animal, the more affordable it is to a wide range of income groups and the more easily it can make use of limited urban spaces (Mougeot, 1994). This suggests that activities focused on smallstock such as chickens, ducks, pigeons, guinea pigs, rabbits, goats and sheep are more likely to benefit also the urban poor in crowded inner sectors of urban centres.

#### (f) Improved Marketing Facilities

Rather than trying to reorganise marketing to replace the existing informal systems, assistance could be given simply by offering improved marketing facilities such as decentralised 'urban farmer markets' which allow direct producer-consumer contacts under hygienic conditions, for example, with access to clean water. This is particularly important for the women selling dairy products and other home-processed foods.

#### (g) Women as Partners

Most reports on urban livestock rearing make no reference to the gender of livestock owners. However, it is frequently mentioned that the work of feeding, watering and healthcare of animals in the urban centres is done mainly by women just as it is in many rural areas and that women are doing much of the informal marketing of small animals in the urban centres. This suggests that particular attention needs to be given to the role of women in urban livestock rearing and that women will be key partners in development efforts. The work done by women in caring for animals particularly providing them with feed and water is time-consuming and even more so in densely-settled areas. Many women have chosen to invest this time, possibly to the detriment of other household chores. This is a fact which reflects the importance that the women accord to livestock. It is likely that these women will be more interested in finding ways to save labour in livestock husbandry rather than to increase livestock production (Laurent and Centres, 1990), and this must be taken into account in technology development activities.

#### (h) Communication and Negotiation

Development agencies should create opportunities for livestock rearers and other urban dwellers to communicate

with each other so as to understand each other's actions and problems and to encourage changes in behaviour. One possibility would be to promote resource-user organisations: common-interest groups which can negotiate with other local stakeholders in jointly defining and implementing regulations for using urban resources such as grazing areas or garbage. Particularly urban crop farmers and livestock rearers need to be brought together to work out forms of interaction which can bring them mutual benefits. Legal arrangements for temporary or multiple use of urban resources must be facilitated in such a way that the great strength of urban livestock rearing—its flexibility—is maintained. Municipal authorities are in a position to provide temporary security of usufruct rights on public and private land and could also provide assistance in conflict resolution.

### Conclusion

The challenge for government services faced with the reality of urban animal farming is to interact in a positive and enabling manner with the producers rather than making vain attempts at banning the animals. Both producers and consumers are in need of well-founded and locally relevant information and appropriate low-cost technologies which permit more healthy and productive animal farming in African urban centres. All stakeholders including the urban authorities will then be in a better position to make wise decisions when jointly planning the use of urban resources for livestock rearing and other sources of livelihood for urban dwellers.

### References

- Achuonjei, P.N. and S. Debrah (1992). "Efficiency of Fresh Milk Marketing in the Bamako Area of Mali: Some Preliminary Results", in R.F. Brokken and S. Seyoum (eds) *Dairy Marketing in Sub-Saharan Africa*. Addis Ababa: ILCA.
- Armbruster, T. (1987). *Die Produktivität der Schafhaltung in der Regenwaldzone der Elfenbeinküste*. Göttingen: Göttingen University, unpublished PhD thesis.
- Carty, W.P. (1991). "Towards an Urban World", *Earthwatch* Vol. 43.
- Centres, J.M. (1991). *Améliorer l'approvisionnement de Bamako en produits maraichers et en protéines animales. 1. Agriculture et élevage à Bamako*. Paris: GRET.
- Centres, J.M. (1992). *Agriculture et élevage urbains et péri urbains à Bobo Dioulasso: Les filières d'approvisionnement en intrants et de commercialisation des produits agricoles*. Paris: GRET.
- Debrah, S. (1992). "Dairy Marketing by Intra-Urban, Peri-Urban and Rural Dairy Producers Near Addis Ababa, Ethiopia", in R.F. Brokken and Seyoum S. (eds) *Dairy Marketing in Sub-Saharan Africa*. Addis Ababa: ILCA.
- Egziabher, A.G. (1994). "Urban Farming, Cooperatives, and the Urban Poor in Addis Ababa", in A. G. Egziabher et al. (eds) *Cities Feeding People: An Examination of Urban Agriculture in East Africa*. Ottawa: IDRC.
- ENDA-Zimbabwe (1994). *Urban Agriculture in Harare: Report on an IDRC-Supported Project*. Harare: ENDA-Zimbabwe.
- Fricke, W. (1979). *Cattle Husbandry in Nigeria: A Study of Its Ecological Conditions and Socio-Geographical Differentiations*. Heidelberg: Heidelberger Geographische Arbeiten 52. Geographisches Institut.
- Gefu, J.O. (1992). "Part-Time Farming as An Urban Survival Strategy: A Nigerian Case Study", in J. Baker and P.O. Pedersen (eds) *The Rural-Urban Interface in Africa: Expansion and Adaptation*. Uppsala: Scandinavian Institute of African Studies.
- Giorgetti, A. et al. (1983). "Caratteristiche degli Allevamenti Bovini nell'area Urbana di Mogadiscio", *Rivista di Agricoltura Subtropicale e Tropicale* Vol. 77 No. 3.
- Hill, P. (1972). *Rural Hausa: A Village and a Setting*. Cambridge: Cambridge University Press.
- Khouri-Dagher, N. (1987). *Food and Energy in Cairo: Provisioning the Poor*. Paris: Food-Energy Nexus Programme, United Nations University.
- Krostitz, W. (1984). "Poultry Development in the Developing Countries", *World Animal Review* Vol. 52.
- Lado, C. (1990). Informal Urban Agriculture in Nairobi, Kenya: Problem or Resource in Development and Land Use Planning? *Land Use Policy* Vol. 7 No. 3.
- Lardinois, I. and A. van de Klundert (1994). "Recovery of Organic Waste in Cities", *ILEIA Newsletter* Vol.10 No. 3.
- Laurent, C. and J.M. Centres (1990). *Dairy Husbandry in Tanzania: A Development Programme for Smallholders in Kilimanjaro and Arusha Regions*. Versailles-Dijon-Mirecourt, (Document de travail, URSAD).
- Lee-Smith, D. and P.A. Memon (1994). "Urban Agriculture in Kenya", in A.G. Egziabher et al. (eds) *Cities Feeding People: An Examination of Urban Agriculture in East Africa*. Ottawa: IDRC.
- Maxwell, D. and S. Zziwa (1992). *Urban Agriculture in Africa: The Case of Kampala, Uganda*. Nairobi: ACTS Press.
- Mbiba, B. (1993). *Socio-Economic and Gender Aspects of Urban Agriculture in Harare, Zimbabwe*. Regional Development Planning Occasional Seminar, 1 October, Institute of Social Studies, The Hague.
- Mbiba, B. (1994). "The Cattle of Chitungwiza: Conflicts on the Rural-Urban Fringe". *ILEIA Newsletter* Vol.10 No. 4.

- Mlozi, M.R.S. et al. (1992). "Urban Agriculture as a Survival Strategy in Tanzania", in J. Baker and P.O. Pedersen (eds) *The Rural-Urban Interface in Africa: Expansion and Adaptation*. Uppsala: Scandinavian Institute of African Studies.
- Mougeot, L.J.A. (1994). *Urban Food Production: A Survey of Evolution, Official Support and Significance*. Paper Presented to "Habitat '94", Edmonton, Canada.
- Nell, A.J. (1992). "An Overview of Dairying in Sub-Saharan Africa", in R.F. Brokken and S. Seyoum (eds) *Dairy Marketing in Sub-Saharan Africa*. Addis Ababa: ILCA.
- Newcombe, K. (1977). "Nutrient Flow in a Major Urban Settlement: Hong Kong", *Human Ecology* Vol. 5 No. 3
- Ngigwana, L.L.M. (1992). "Dairy Imports and Their Influence on Domestic Dairy Marketing, With Particular Reference to Tanzania", in R.F. Brokken and S. Seyoum (eds) *Dairy Marketing in Sub-Saharan Africa*. Addis Ababa: ILCA.
- Orskov, R. (1994). "Landless Livestock Keepers", *ILEIA Newsletter* Vol. 10 No.4.
- Sachs, I. (1986). "Work, Food and Energy in Urban Ecodevelopment", *Development: Seeds of Change* Vol. 4.
- Sawio, C.J. (1993). *Feeding the Urban Masses? Towards an Understanding of the Dynamics of Urban Agriculture and Landuse Change in Dar-es-Salaam, Tanzania*. Worcester : PhD thesis, Graduate School of Geography, Clark University.
- Sawio, C.J. (1994). "Who Are the Farmers of Dar es Salaam?", in A.G. Egziabher et al. (eds) *Cities Feeding People: An Examination of Urban Agriculture in East Africa*. Ottawa: IDRC.
- Séré, C. and R. Neidhardt (1994). "Stadt-Land-Integration im Rahmen Periurbaner Tierproduktion", *Entwicklung und ländlicher Raum* Vol. 2 No. 94.
- Smit, J. and J. Nasr (1992). "Urban Agriculture for Sustainable Cities: Using Wastes and Idle Land and Water Bodies as Resources", *Environment and Urbanization* Vol. 4 No. 2.
- Staal, S.J. and B.I. Shapiro (1994). "The Effects of Recent Price Liberalization on Kenyan Peri-Urban Dairy: A Case Study Using the Policy Analysis Matrix Approach", *Food Policy* Vol. 19 No. 6.
- Walshe, M.J. (1991). *Dairy Development in Sub-Saharan Africa: A Study of Issues and Options*. Washington DC: Technical Paper 135. World Bank.
- van der Blik, J. (1992). *Urban Agriculture: Possibilities for Ecological Agriculture in Urban Environments as a Strategy for Sustainable Cities*. Leusden: ETC.

**Cairo, Egypt.** Chickens, ducks and poultry raised in backyards in urban and peri-urban areas are regularly sold in city streets



Photo: Wolfgang Bayer

**Kaduna, Nigeria.** Unattended flocks of sheep wander through the informal settlements and engulfed villages which now make up large parts of northern Nigerian cities

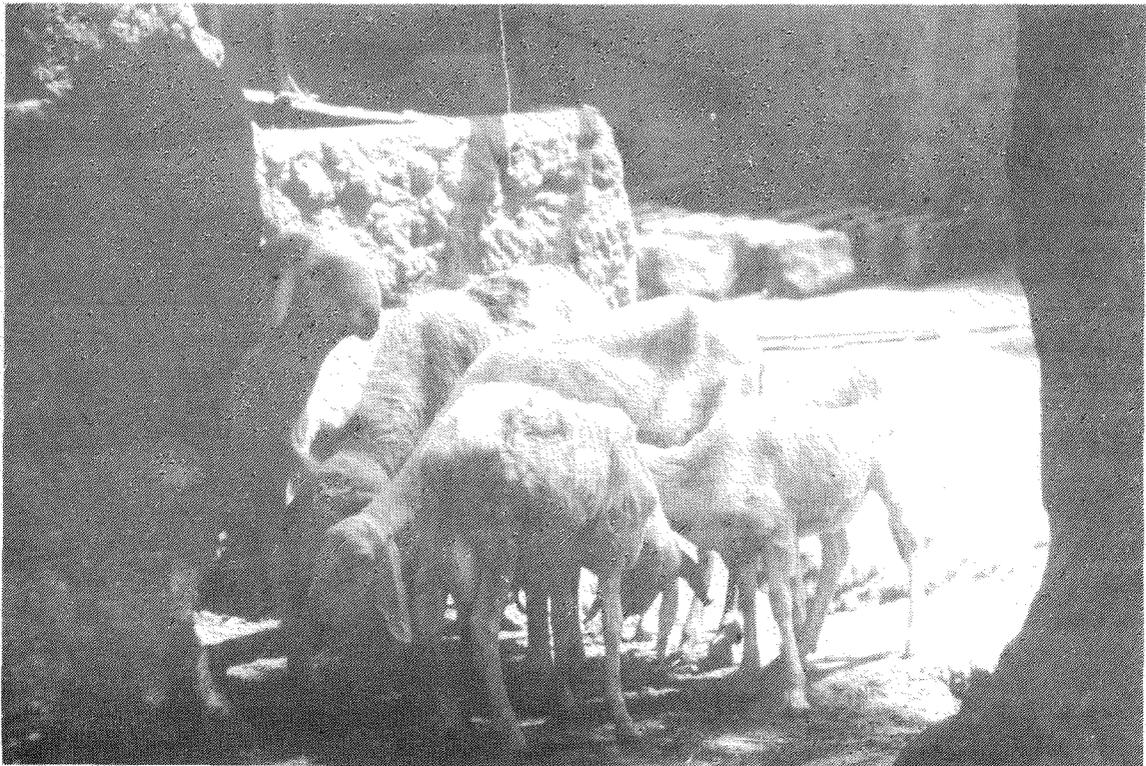
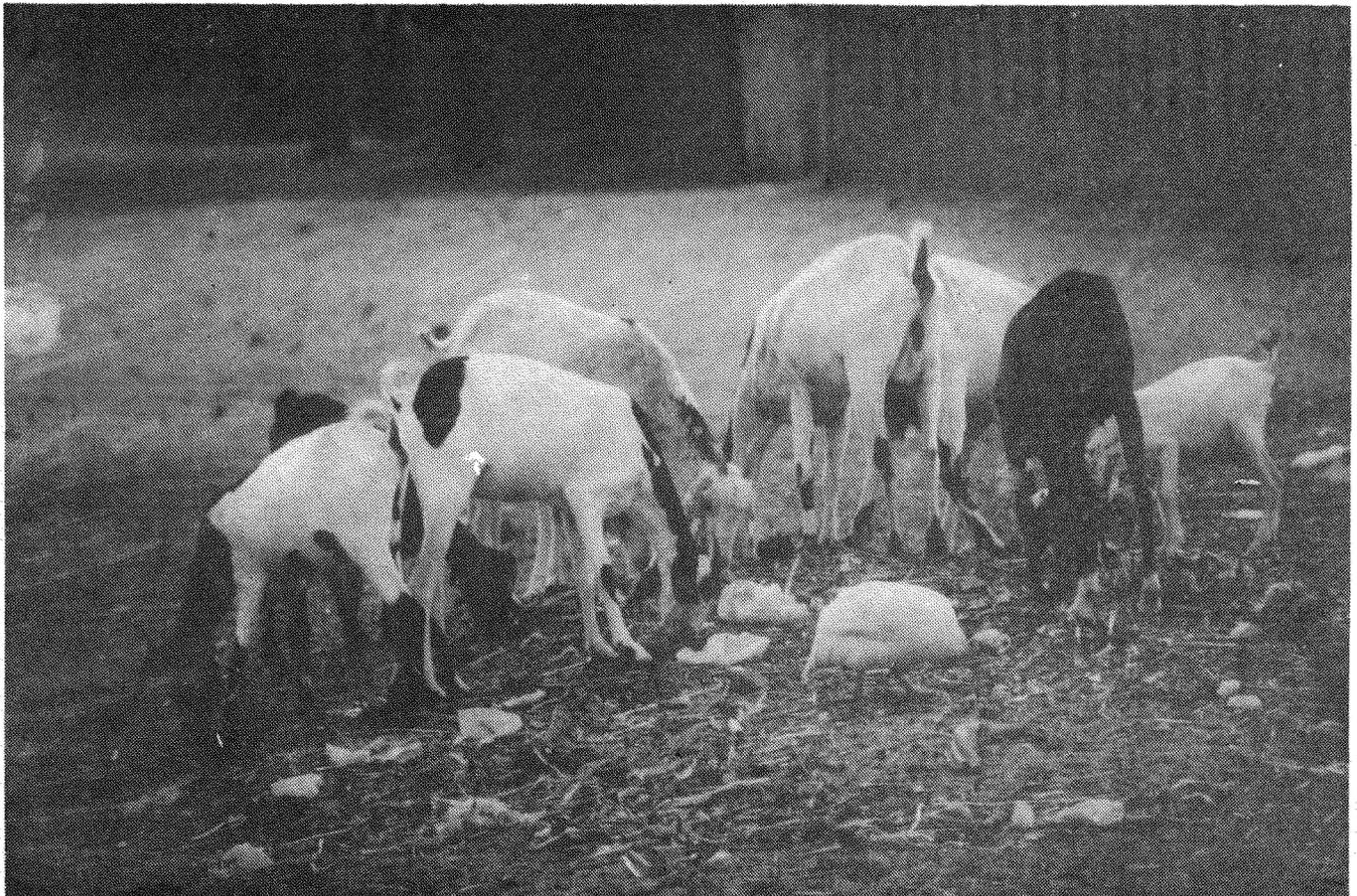


Photo: Wolfgang Bayer

Small stock scavenging for food, a typical scene in towns throughout Burkina Faso

Photo: Wolfgang Bayer



## URBAN MICROFARMING IN CENTRAL SOUTHERN AFRICA: A CASE STUDY OF LUSAKA, ZAMBIA

A.W. Drescher

Department of Applied Physiogeography of the Tropics and Subtropics (APT), University of Freiburg i. Br., Germany

### Abstract

Accepted January, 1996

*The relationship between urban food production, food security and the urban environment has been largely neglected in the past. In Lusaka, Zambia as in many other tropical urban centres, gardening and cropping receive very little support from local authorities. Indeed, city councils often prohibit these activities. Production of staple foods prevails in the wet season, and vegetable production in the dry. Both activities largely depend on access to resources like water and land. Within the high- and medium-density squatter quarters, vulnerability in terms of food security differs. In the Zambian case, it was found that dry-season cultivation is not practised by the most vulnerable households but rather by those which have access to essential resources for this activity. In Lusaka, garden size decreases with increasing population density. The walking distance to sources of water is much further in the high-density areas, making microfarming more difficult there. Access to both land and water is lowest in the high-density, low-income compounds in Lusaka.*

*Microfarming obviously contributes to household food security in the city both directly by providing food and indirectly by generating income. There are significant differences between the role of women and men in urban household food security. Women are the major actors in urban microfarming but face many obstacles with respect to income generation and access to resources and markets. There is urgent need for appropriate support of urban agriculture in the future. The paper tries to give some ideas.*

### Résumé

*Par le passé on a largement négligé la relation qui existe entre la production alimentaire, la sécurité alimentaire et l'environnement urbain. A Lusaka en Zambie, le maraîchage et autres cultures restent très peu appuyés par les autorités locales. En effet, les administrations urbaines interdisent souvent ces activités. Typiquement, à Lusaka la production de denrées de base tire profit de la saison des pluies tandis que les cultures maraîchères perdurent en saison sèche. L'accès des producteurs aux ressources détermine largement la localisation et l'ampleur de leurs cultures. Au sein des bidonvilles à forte et moyenne densité d'occupation, la vulnérabilité des gens à l'insécurité alimentaire varie. Dans le cas zambien, les cultures de saison sèche ne sont pas pratiquées par les ménages les plus vulnérables, mais bien par ceux qui ont accès aux ressources requises. A Lusaka les parcelles cultivées sont plus réduites dans les secteurs plus densément peuplés. Les distance de marche aux points de puisage sont plus grandes dans ces secteurs, ce qui y rend la microculture plus difficile. L'accès au sol et à l'eau est fortement limité dans les secteurs denses à bas revenus de Lusaka. En général, la microculture contribue à la sécurité alimentaire des ménages en ville, directement en lui procurant des aliments et indirectement en générant des revenus de vent. Le rôle des femmes se distingue clairement de celui des hommes dans les stratégies du ménage pour réduire son insécurité alimentaire. Malgré le fait qu'elles dominent la pratique de la microculture, les femmes sont désavantagées en ce qui a trait à la génération de revenus et l'accès aux ressources et aux marchés. Il y a besoin urgent d'appui adéquat à l'agriculture urbaine et l'article soumet quelques recommandations en ce sens.*

### Urban Microfarming: A Neglected Issue

Food availability and stable access are both critical to household food security. The means for procuring food (produced, purchased and gathered) and the social mechanisms that buffer households from periodic shocks determine the households' access to food (Frankenberger, 1992). Thus the possibility to garden is the basic requirement to self-sufficient or additional food production of a household. Food might be available on the markets but not attainable to the households because prices are too high.

When agricultural activities in urban centres are examined, a one-sided view is often taken, for example, on

staple food production or on vegetable production. There is an urgent need to realise that this issue should be looked at in a more holistic way. As emphasised during a recent workshop (DSE/ATSAF, 1994), research and planning in urban agriculture requires interdisciplinarity. The term urban microfarming is used here to reflect this need for a comprehensive understanding of agricultural land-use in urban centres. It encompasses urban crop production, homegardening, horticulture (both vegetables and fruits) and livestock keeping. Also the gathering of wild fruits and vegetables is a strategy of urban people to achieve greater food security. The survival of many urban families in southern

*Acknowledgements*—Very special thanks to Frieda Bos (Agricultural University of Wageningen, The Netherlands), for contributing in field work and theoretical framework and especially for the support of the socioeconomic component of the research project. Paul Muwowa (University of Zambia) strongly supported the fieldwork, helped a lot to understand the people and was a perfect student. Thanks also to the FAO Project (TCP/ZAM /2553), Lusaka/Zambia for the support of the research project in 1993. Dr Ann Waters-Bayer (ETC, The Netherlands) did a great deal in revising the article and contributing with good ideas how to make it better.

Africa depends on these activities, which help to produce additional food and income, thus increasing food security and the standard of nutrition. As will be shown with respect to the timing and organisation of labour inputs, there are significant differences between these activities including gender-specific differences.

In Zambia, field crops are grown in the wet season to produce the staple foods. In rural and peri-urban areas, gardens and field crops are distinctly separated, but in urban areas a plot near the house is often used as a homegarden in the dry season and as a crop field in the wet. Here, as in many other countries, the homegarden is not exclusively a vegetable garden. It may include crops that are mainly sources of food carbohydrates rather than what Western horticulture classifies as vegetables as well as fruits, fuelwood, herbs, medicinal plants and plants grown for their ornamental or magical value (Brownrigg, 1985). Under the climate conditions in Zambia, staple food production is restricted to the wet season. Both men and women are involved. The staple crops in urban areas include maize, sorghum, millets and cassava as well as substitutes for staples such as sweet potatoes and groundnuts. In addition, vegetables such as pumpkins, beans, okra, tomatoes and cucumbers are grown as intercrops. This type of urban cultivation has the nutritional role of bringing a combination of carbohydrates, vitamins and micro-elements into the human diet. Urban homegardening is done mainly by women, with the help of their children in watering and weeding. It may be done year-round or only in the dry season, when it is highly dependent on the availability of water. The main nutritional roles of urban homegardening is to diversify the diet and to provide vitamins (mainly through vegetables). In Zambia, urban livestock keeping, which is even more ignored than other components of urban microfarming, is also mostly done by women, with some important support of children. It brings benefits in terms of both cash and food for the families. This activity, as well as the hunting of small animals has the nutritional role of providing animal protein. Microfarming is part of the biotic component of the urban environment and competes with the abiotic components such as buildings and roads. Therefore, urban microfarming needs to be considered in urban planning activities. Development of more sustainable cities will require an improved balance between the biotic and the abiotic environment (van der Bliek, 1992).

Urban microfarming has been largely ignored by researchers, extension services and policymakers (Mougeot, 1993: 2–5; Lamba, 1993: 17–18; Streiffeler, 1993 and 1994; Ratta and Smit, 1993; Greenhow, 1994a and Drescher, 1994). It has been regarded as economically marginal. In Africa, women are traditionally responsible for feeding their families. In urban areas, this role is not planned for as it is assumed that subsistence activities do not take place in urban centres (Lee-Smith and Lamba, 1991: 37–40). Another reason for the neglect of urban microfarming has been the focus especially by development agencies (Drescher, 1995), on staple food production for the urban centres, which is thought to be possible only in rural areas. As the economies of many African countries started to deteriorate in the 1970s and consequently the living conditions worsened, agriculture

became one of the most important sources of food and income in urban areas (Schilter, 1994 and TUAN, 1994).

### **The Potential of Urban Microfarming in Africa: Some Examples**

Globally, about 200 million urban farmers provide food and income for about 700 million people (Smit et al., 1996). In 1993, in high-density areas of Harare, Zimbabwe, more than 300 t of maize were harvested (ENDA-Zimbabwe, 1994). In Dar es Salaam, Tanzania, urban agriculture was the second largest employer in 1988. In Kenya, 25 percent of the urban families are absolutely dependent on self-produced food. According to Maxwell and Zziwa (1992) in Lusaka, Zambia, one-third of the urban poor produce all of their own food. Low-income groups are highly involved in vegetable gardening in Maseru, Lesotho: 69 percent of these families produce vegetables while only 39 percent in high income areas do so (Greenhow, 1994).

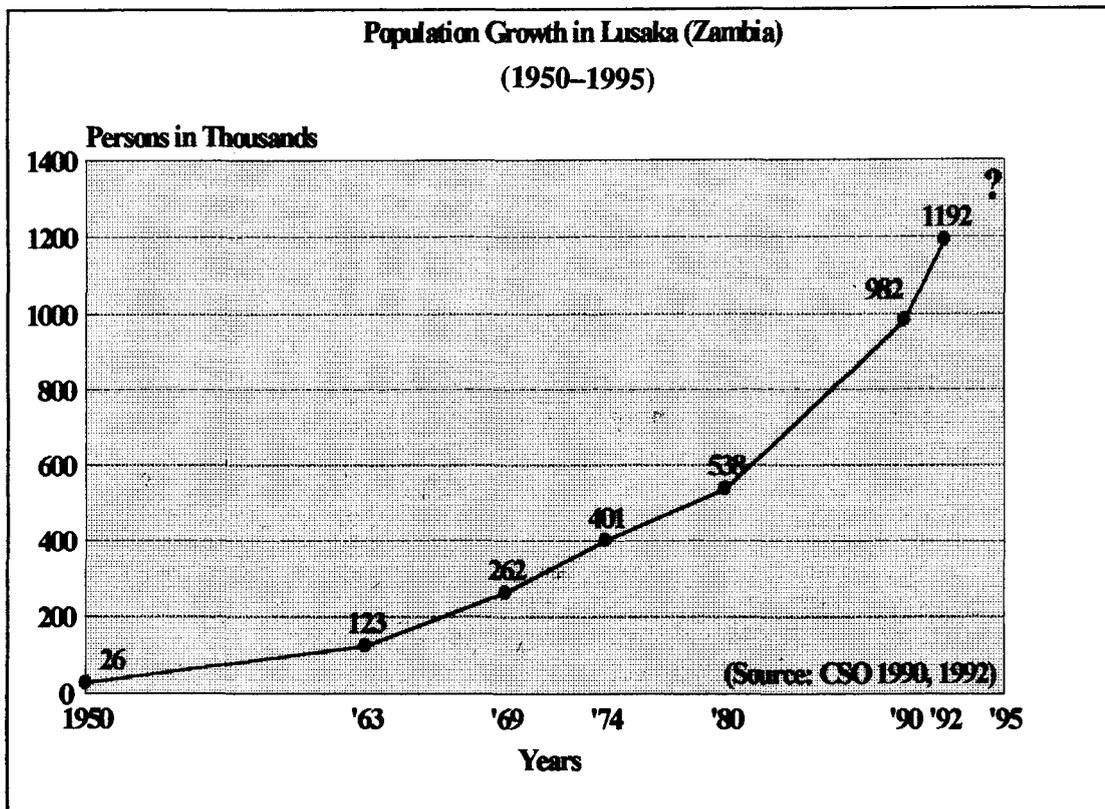
In high-density areas surveyed of Harare, 86 percent of the households keep small livestock and 49 percent of these households keep chickens (ENDA-Zimbabwe, 1994). Poultry keeping in the backyard is very common in many African urban centres. For Kampala, Uganda, 70 percent of the poultry needs are produced inside the city (Maxwell, 1994: 47–65). From many countries, it is reported that activities in staple food production, vegetable growing and small livestock keeping are greater in high-density than low-density residential areas. In Maseru, Lesotho, low-income areas on rocky soils have relatively more livestock production (pigs and poultry) than other areas with better soils (Greenhow, 1994a). This type of urban agriculture is particularly important for generating cash. In urban areas, not only small-scale subsistence livestock-keeping but also commercial production is found. Milk, pig and poultry production are common in many African cities.

### **Urban Microfarming: Case Study of Lusaka, Zambia**

Lusaka is one of the fastest growing urban centres in the developing world and had a population of 1,192 million inhabitants in 1991 (Zambia, 1990 and 1992, figure 1). Since 1980, its population has nearly doubled, growing at a rate of 6.1 percent between 1980 and 1990, when the population density was 2,728 persons per km<sup>2</sup> (Zambia, 1990). Looking at these figures and taking into account the overall economic situation of the country, it becomes obvious that food production in urban areas is a necessity for the survival of the poor. These days, to eat a single daily meal is becoming commonplace in African urban centres (Vennetier, 1988: 209–226, cited by Mougeot, 1994). Consequently malnutrition, microelement deficiencies and hunger are growing worse.

In Zambia, politicians dislike dealing with issues of urban microfarming, in the past as in the present. It was, therefore, quite exceptional when former President Kenneth Kaunda told the National Assembly in 1977 that the inhabitants of Lusaka must grow their own vegetables and cereals. His message did not reach the Lusaka City Council (LCC), even in the drought year of 1992, with its extreme shortage of food, the LCC suppressed urban agriculture by threatening to slash the maize. One of the official reasons given was the

Figure 1, Population growth in Lusaka, Zambia (1950–1995)



possible health hazard: maize crops supposedly facilitate the breeding of malaria-bearing mosquitoes (Sanyal, 1985: 15–24), an argument that is repeated season after season. In the case of Lusaka, it is obvious that the lack of environmental hygiene (non-existent or non-functioning sewage systems) is much more likely to favour malaria than are urban crops or other vegetation. In the meantime, it has become obvious that urban agriculture is not, as assumed by most authorities, “a remnant of bush life” (Sanyal, 1985: 15–24) but rather a survival strategy of urban people. However, it is still necessary to convince urban authorities of its importance for the well-being of the population and the sustainable development of urban centres. According to Jaeger and Huckabay (1986), three kinds of cultivation can be distinguished in urban and peri-urban areas: small-scale commercial agriculture on smallholdings; houseplot gardening (homegardening) and scattered cultivation on vacant land in and around townships.

This article focuses on vegetable production in small urban houseplots and staple food production in the fields, describing the main results of the survey and highlighting the difficulties faced by the poorer families in their gardening activities. Part of this article is based on a Food and Agriculture Organisation (FAO) report prepared by Drescher and Bos (1994).

### Methodology

In 1992/1993 a survey on urban microfarming (with special emphasis on homegardens) was carried out in Zambia. It covered the urban and peri-urban areas of Lusaka and two rural areas in the Southern and Northwestern Provinces of the country (figure 2). Components of the research programme were the homegarden survey, the wet season cropping survey, the compound survey on agricultural activities and the market survey. This article concentrates on the situation of the urban population of Lusaka. The main objectives of the survey were to determine the role of homegardens for the households; determine the contribution of garden products to the diet of household members and to household budget; make an inventory of the main problems faced by households in their homegardening; discover why certain households practise gardening whereas others do not. For the data analysis a PC based database was created.

#### (a) Homegarden Survey

People living in low-income, high- and medium density squatter quarters are mostly affected by lack of food and income in Lusaka. Therefore, the study concentrated mainly on these groups. In Lusaka, 34 homegardens were studied in detail, in some cases in both dry and wet season, and the owners or users were interviewed with the help of a standardised questionnaire to obtain data on the socio-economic background, objectives of gardening, access to resources like water, land, credits and markets, input and garden practices, labour, seeds, and the gardeners own perception of the gardening activity. Complementary fieldwork was carried out to obtain objective information on the presence of pests, diseases and predators, the quality of compost (if used), the size of the gardens, distance to the water source and homestead, among others. The plants grown

were recorded and counted by individuals to determine species diversity and yields.

#### (b) Wet Season Cropping Survey

In the 1992/1993 rainy season the survey on wet season cropping activities covered some of the open spaced areas inside Lusaka. The fields were measured and cultivated plants were recorded as well as intercropping systems, planting distances and special cultivation practices.

#### (c) Compound Survey on Agricultural Activities

The compound survey was carried out in 1992/1993 in eleven compounds of Lusaka by using a brief standardised questionnaire including four questions such as (i) Do you practise gardening? (ii) Do you cultivate in rainy season? (iii) Do you water in dry season?, and (iv) Do you own or use more than one garden? The purpose of this survey was to find out how many people are involved in gardening and in rainy wet season cultivation. In each compound a minimum of 50 persons (25 women and 25 men) were asked randomly. In total 648 people were interviewed.

#### (d) Market Survey

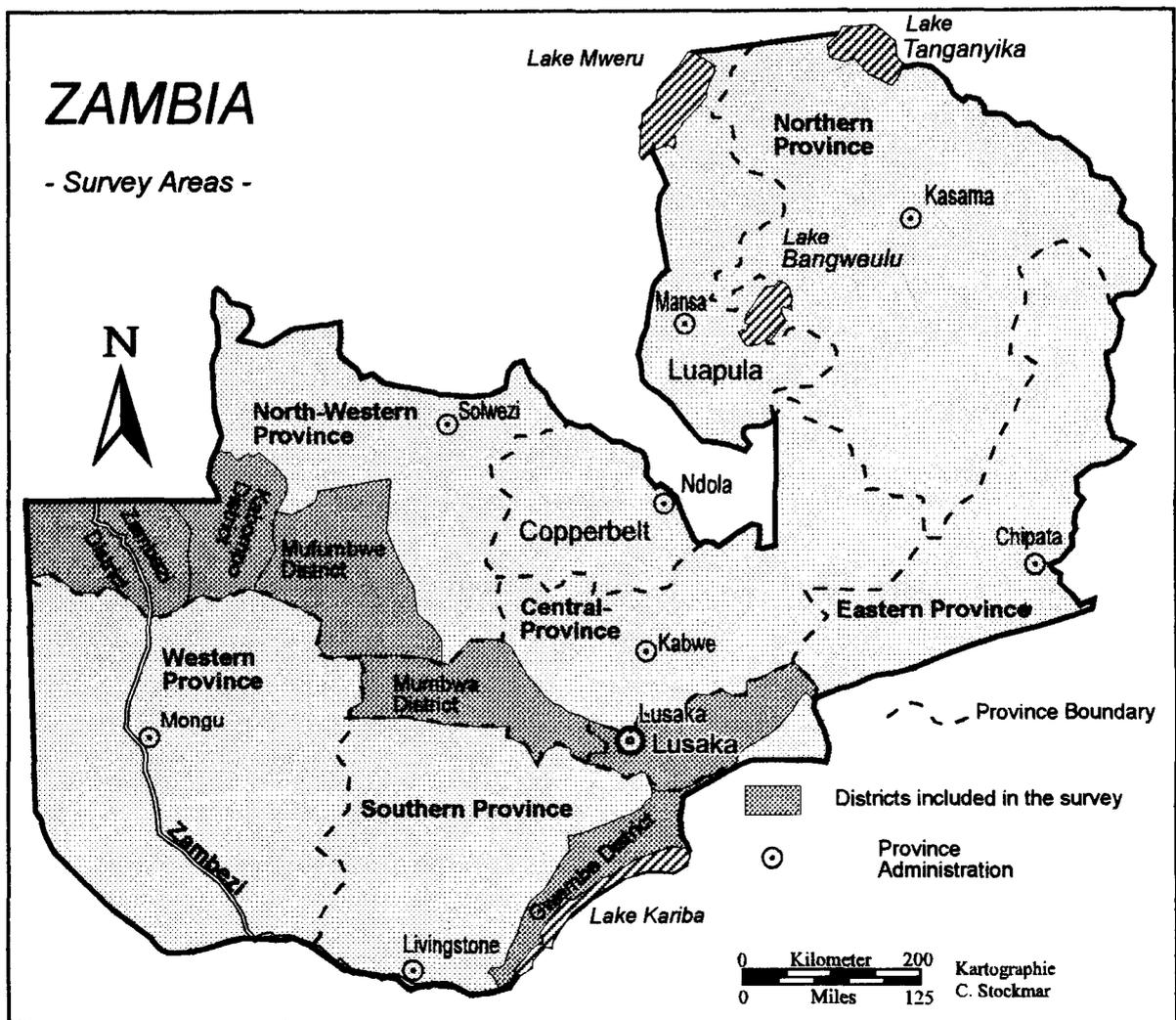
The market survey was carried out on four retail markets in different areas of Lusaka (low- and high-income) and on the main market in Lusaka for 12 months in 1992/1993. Aims were the survey of price development for selected products, the standardisation of informal weights and the estimation of possible income generation by selling homegarden products.

### Wet-Season Agriculture

Van der Berg (1982) and Jaeger and Huckabay (1986) identified the geographic localities of different types of microfarming in concentric circles around the urban centre. The central zone is dominated by homegardens while the semi-commercial and commercial types are situated in the periphery. The latter forms are mainly confined to the rainy season (end of October to mid-May). Gardening is practised year-round only near permanent sources of water (streams, dams, rivers and natural wetlands). In addition, inside and on the edge of the city, there are wet-season plots of staple foods and vegetables. These plots had an average size of 300 m<sup>2</sup> in 1986 (Jaeger and Huckabay, 1986). Schultz (1976) described them as “subsidiary gardens”, while Schlyter and Schlyter (1980) called them “distant gardens”. These fields are mainly on fallow areas inside urban centres which are being used illegally. Van der Berg (1982) described this land-use type as “semi-vacant landuse”. The limited land resources are fully used in the wet season: also public property like the university campus, areas around hospitals and roadside strips are farmed illegally.

In the 1992/1993 wet season, 37 of such fields were measured in different quarters of Lusaka (tables 1 through 5). Since 1986, the average size has increased significantly to 423 m<sup>2</sup>, possibly because of the deterioration in the economic situation. Similar observations were made in Harare, Zimbabwe where the cultivated area of staples has greatly increased in the last decade (ENDA-Zimbabwe, 1994). Very rarely are the cultivated areas larger: only two

Figure 2, Survey area in Lusaka, Zambia



Field	Size (m <sup>2</sup> )	Maize	Beans	Pumpkin	Sweet Potato	Banana	Okra	Tomato	Observations
1	252	•		•					
2	270	•	•		•				
3	456	•	•	•		•			Sweet potato on ridge bed Bananas on central furrows
4	594	•	•	•				•	
5	600	•	•	•					
6	700	•	•	•					
7	1,125	•	•	•			•		

Average size: 571 m<sup>2</sup>  
Source: Compiled by the author

large plots were observed (one more than 3,500 m<sup>2</sup> and another more than 2,000 m<sup>2</sup>). In 96 percent of the observed fields, maize was grown, followed by beans (46 percent), pumpkins (36 percent) and sweet potatoes (20 percent). As the leaves are eaten from the three latter plants, they help to cover part of the vegetable needs in the wet season. In addition, many wild plants (e.g. *Amaranthus* spp.) are used as vegetables. Nearly 40 percent of the respondents living in Lusaka town still gather wild vegetables; in peri-urban and rural areas, 80 percent of the households in the survey

practised gathering (figure 3). All these families also have gardens, which are complemented by their gathering activities.

In the wet season, any open space in the urban environment is used for cultivating crops. The following tables give details on the size of some of the fields surveyed inside Lusaka in the 1992/1993 wet season and on the intercropping systems found in these fields. Comparison of the cropping patterns in the different areas suggests that there is some informal exchange of information between the city farmers. Friday Corner, Chainama Hills and Ibex Hill show very similar patterns while patterns at City Airport and the University Dambo differ (tables 1, 2, 3 and 4). The high exposure to theft in these two areas may explain the lower diversity of crops, especially of vegetables. Another reason may be lack of access to resources (e.g. seeds) of the very low-income groups. Most likely, the basic combination of crops of all areas is related to the supply of seed. Seeds are normally obtained through the distributors of Zamseed, the

Field	Size (m <sup>2</sup> )	Maize	Beans	Pumpkin
8	544	•	•	•
9	564	•	•	•
10	690	•	•	•
11	864	•	•	•

Average size: 666.5 m<sup>2</sup>  
Source: Compiled by the author

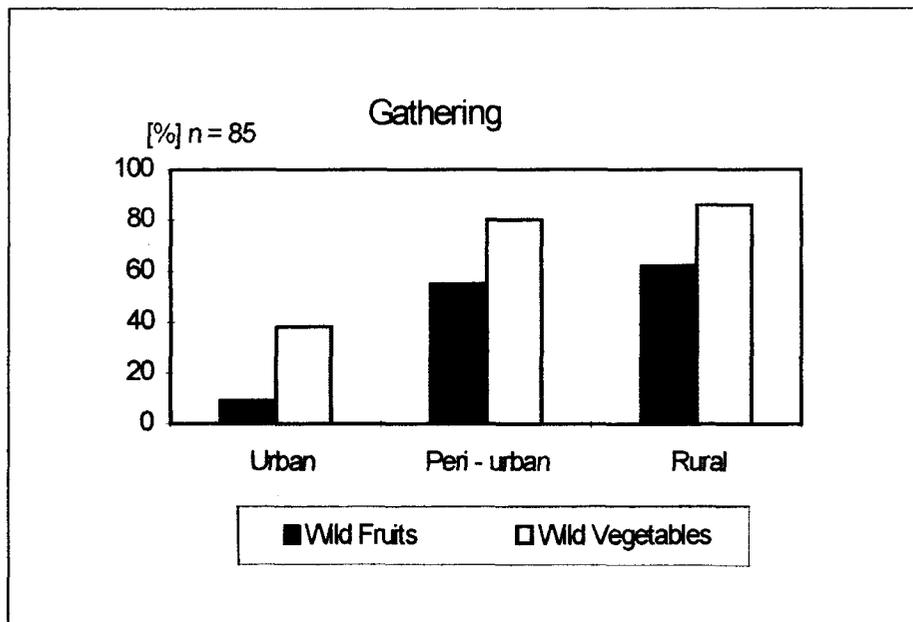
Field No.	Size (m <sup>2</sup> )	Maize	Beans	Sweet Potato	Observation
12	102	•			
13	140	•	•		
14	253	•	•		
15	301	•	•	•	Ridge bed
16	360	•	•		

Average size: 231.2 m<sup>2</sup>  
Source: Compiled by the author

Field No.	Size (m <sup>2</sup> )	Maize	Beans	Pumpkin	Sweet Potato	Okra	Groundnut	Cucumber
17	60	•	•					
18	80	•						
19	112	•						
20	189	•	•	•				
21	270	•		•				
22	336	•						
23	392	•						
24	400	•	•				•	
25	496	•						
26	525	•						
27	549	•		•		•		•
28	816	•						
29	880	•			•			
30	966	•						
31	1,050	•	•			•	•	

Average size: 474.7 m<sup>2</sup>  
Source: Compiled by the author

Figure 3, Gathering still plays an important role in nutrition, even in the urban centre of Lusaka



(Source: Field Survey 1992/1993)

national seed company. Maize seed is often kept from previous year's harvest.

The pure maize stands are spaced at 90–100 cm between rows and 60–90 cm between plants (figure 4). This is much wider than the official recommendation for spacing: 30 cm between plants (Purseglove, 1988). The wide spacing at the beginning of the wet season allows flexibility for mixed cropping: vegetables can be planted later in the empty spaces. A field may contain up to four different crops at one time. The different combinations are indicated in the tables. Most common is an intercropping system with maize, beans and pumpkin. The 10 most commonly recorded crops in mixed systems are maize, bean, pumpkin, sweet potato, banana, okra, tomato, cucumber, groundnut and cassava. Bananas are perennials and have the ecological function in intercropping systems of providing shade and organic material (mulching) and protecting crops from wind.

According to Sanyal (1985), wet-season cropping is done mainly by the urban dwellers with the lowest per capita income (figure 5). This group does very little homegardening, whereas the somewhat less poor, low-income families do both wet-season cropping and homegardening. In the case of the poorest, their lack of access to resources is thus partly compensated by (usually illegal) staple food production in the wet season.

Of 648 persons asked about their involvement in agricultural activities in Lusaka, 42.6 percent answered "yes, we practice gardening". As figure 6 shows, there are significant differences between the different townships of Lusaka with respect to involvement in agriculture (referring here to the production of staple foods). There are also gender-specific differences, women being much more involved than men in, e.g. Kanyama township, whereas almost as many men as women practise agriculture in George. The lowest level of involvement in urban cultivation was recorded in this township. Originally a squatter settlement, this is a very densely-settled area with no space for growing staples. Some people rent a piece of land from farm owners near the township for wet-season plots, and pay in cash or kind (e.g. bags of maize or groundnuts).

Kanyama is a squatter settlement in southwest Lusaka. There is a fair amount of open space around it, but agricultural use is limited by the many rock outcrops. Here, people shift to roadstrip cultivation along old Mumbwa Road. Olympia Park and Matero are medium-density areas, where cultivation is possible both between the houses and in nearby open spaces. In both townships, involvement of inhabitants in wet-season cropping is very high.

People living in Kalingalinga, an old squatter settlement, use the areas around the City Airport, Chainama Hills Hospital and the University for wet-season cropping. Bowa et al. (1979) reported that 73 percent of Kalingalinga residents had a distant garden. This was confirmed by the recent survey, and has obviously not changed in the last 15 years. These people belong to the lowest income group in Lusaka. This confirms Sanyal's above-mentioned statement that the poorest of the poor are highly involved in wet-season cropping. Nevertheless, their involvement depends very much on the availability of arable land. Nearly 50 percent of the women but only 35 percent of the men practice agriculture in Lusaka. Also the role of children should not be neglected. From quite a young age, they provide a valuable labour force in food production for the household and contribute also in other ways to household income. In all townships, women are more involved than men in both dry-season gardening and wet-season cropping. The production of staple foods prevails in the wet season, and vegetable production in the dry season. Similar observations were made in rural areas of Zambia and Zimbabwe.

South of the Sahara, the labour of women is more important than the labour of men in all aspects of food production (Fresco, 1985). Women provide the labour needed in every phase of the food cycle to guarantee the family's nutrition. At the same time, they cannot neglect their other tasks of food preparation, childcare, fetching water and fuelwood, washing, housecleaning and looking after the small animals (Purseglove, 1985). Besides these tasks, women also generate income, which is often more than half of the total household income (Due, 1985 and Fresco, 1985). Thus, in a multitude of ways, women play an important role in household food supply: through their productive labour; through their decision-making about production, consumption and division of food; and through the income they generate, which is often used to buy food. Various studies have shown that women's income has a greater positive impact on the health and nutritional status of the children than does men's income (Maxwell and Smith, 1992).

Gardening on termite mounds in natural wetlands (*dambos*) is a special type of wet-season microfarming. One example is the so-called 'UNZA Dambo' south of the University of Zambia (UNZA) and adjacent to Kalingalinga township. Termite mounds provide ideal sites for gardening because they are not influenced by groundwater and are therefore not waterlogged in the wet season. The activity of the termites provides nutrients to the crops. Table 5 gives an overview of some wet-season plots at UNZA Dambo. Sweet

Table 5, Land-Use on Wet Season Plots at UNZA Dambo

Field No.	Size (m <sup>2</sup> )	Maize	Pumpkin	Sweet Potato	Okra	Observation
32	24			•		Ridge bed
33	140	•				
34	189	•				
35	196	•				
36	520	•	•		•	
37	560	•		•		

Average size: 321 m<sup>2</sup>  
Source: Compiled by the author

Figure 4, Planting distances in maize on different sites in Lusaka (averages of 10 single measurements, 1993/1994, wet season)

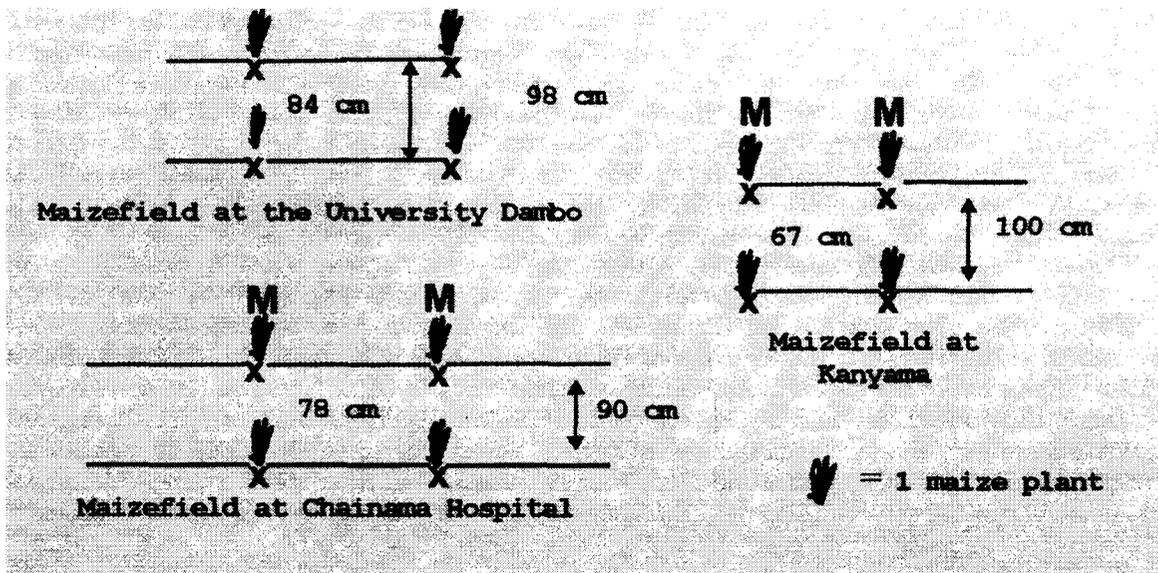
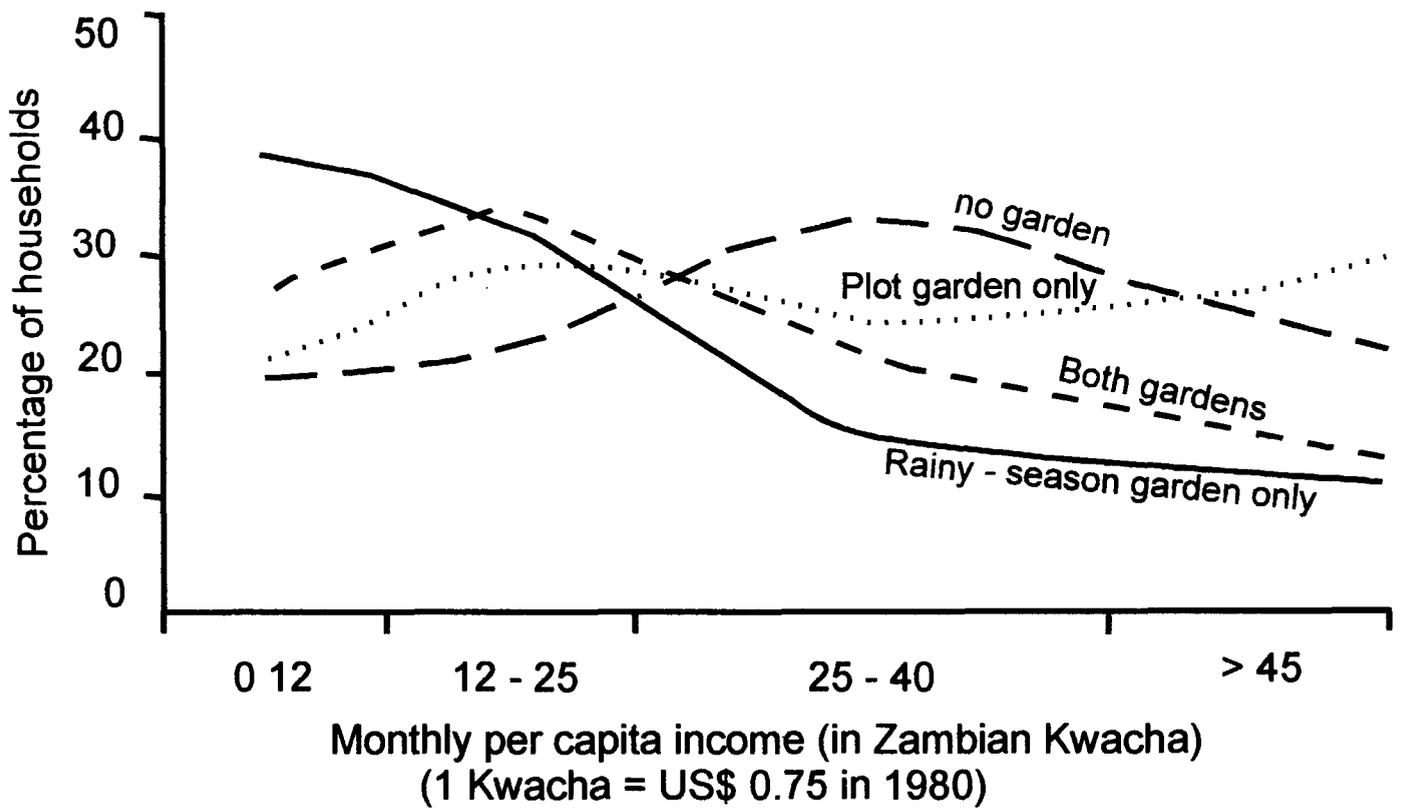
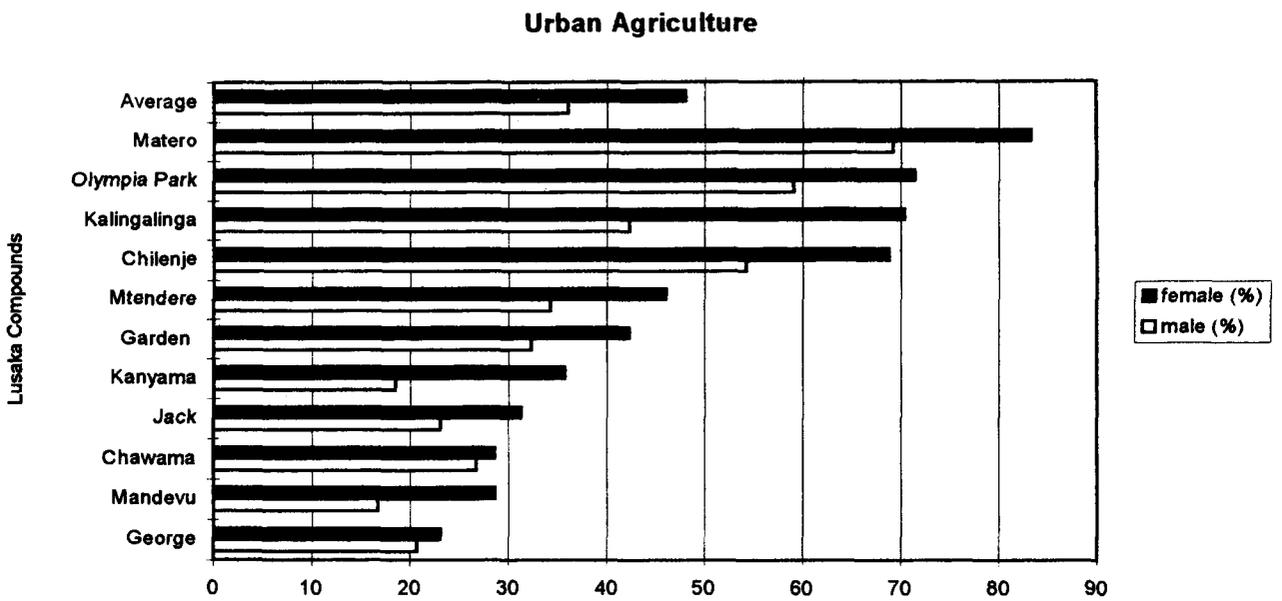


Figure 5, Nature of cultivation by per capita income



(Source: Adapted from Sanyal, 1985)

Figure 6, Percentage of respondents practising urban staple food production



potato is often planted on ridge beds. This keeps the roots above the waterlogged area and enlarges the space for tuber development. Sweet potato growing appears to have increased in recent years. There is a direct connection between wet-season cropping and homegardening with respect to sweet potato: the garden serves as a nursery for the plant, which is transferred to the fields at the beginning of the wet season. As reported by Hardon-Baars (1990), sweet potato is used in The Philippines and in Indonesia as a buffer crop for food security because they can remain in the soil for a long period and are harvested directly for consumption. The termite mounds have been cultivated by Kalingalinga residents since the 1950s. They are used only in the wet season. Of the unskilled workers (cleaners and security guards), 76 percent sell part of the produce, while only 9 percent of the skilled workers do so (Jaeger and Huckabay, 1986). These figures clearly show the differences between low-income and higher-income groups and the importance of wet-season urban cropping for income generation. There is no established method of obtaining a termite mound. In the case of undeveloped land, it is "first come, first acquired" (Jaeger and Huckabay 1986). Near the University buildings, the arable area is often occupied by the employees of lecturers. In this case, the fields are considered as belonging to the accommodations, and the owner is the authority who informally allows their use.

### Urban Vegetable Production

The broadest definition of the homegarden "as a distinctive system of agricultural production carried out by households" is given by Brownrigg (1985). The homegarden is classified as a separate and unique system of agricultural production. Observations made during the fieldwork revealed that Zambian homegardens differ considerably from homegardens as described in most literature. Seasonality of climatic conditions is one reason for these differences. Most reports on homegardens are based on data collected in the humid tropics, where seasonality is less prevalent. Most, but not all, definitions of homegardens limit their location to a place near the residence. They are sometimes also called "house gardens" (Thomson, 1954) or "kitchen gardens" (Brownrigg, 1985). Such definitions exclude agricultural production located at some distance from the home. There is little information in the literature about the location of homegardens in tropical unimodal climates, i.e. with one dry season and one wet season. Establishment of a homegarden in the dry season requires the existence of a water source near the homestead. In urban areas, some households have access to water near or even inside the house. Depending on the economic status of the area (varying from high-cost housing to squatter areas), the water supply comes from piped water in the homes or from communal wells. If space allows, a household can—in principle—use the area for cultivation. To avoid further discussions about distance to the house and size of the garden, the homegarden is defined here as an essential activity of the household, no matter how far the garden lies from the home.

The differences in involvement of the urban population in wet-season cropping (staple food production) and dry-

season homegardening become obvious when figures 7 and 8 are compared. Nearly 30 percent of the respondents practise irrigation or watering in the dry season, i.e. they keep gardens. In total, 32 percent of the women and 24 percent of the men practise gardening. In Chilenje and Matero, nearly half of the women practise gardening, compared with only about 25 percent of women in other townships like Matero, George and Chawama. Kanyama is a special case with very little gardening activity. Here, on account of the rock outcrops, the high population density and the poor water supply, only 10 percent of the women and 7 percent of the men do any gardening.

Homegardening comprises various activities with different demands on labour and time. These activities are: clearing/preparing the garden bed; sowing in the nursery; transplanting of seedlings; weeding and watering; harvesting; and processing and marketing. The tasks of men and women do not differ greatly, with the exception of fencing, which is a male task. Fences must be renewed as often as once a year, depending on the materials used. Preparing the garden bed is heavy work, especially if the plot was not cultivated during the wet season and must be cleared again. Clearing is mainly a male task. Younger children provide valuable labour. They start to help with watering the garden at the age of 9–10 years (sometimes even younger), and also help in weeding. On average, the respondents spend about 15 hours per week on gardening. Here, there is a significant difference between women and men: men active in gardening do this for an average of almost 20 hours per week, while women gardeners spend only 12 hours per week in the garden.

A relationship was also found between the hours spent on gardening and the aim of gardening: the more commercialised the activity, the more hours are spent on it. No correlation could be found between size of garden and hours spent gardening, possibly because people with larger gardens found ways to make the work less labour-intensive. If water or labour is lacking at crucial periods, the gardening activity may be abandoned. The main gardening activities take place in the dry season. In the wet season most of the gardens are transformed into crop fields, mainly with maize. The year-round labour calendar is as follows: April/May: preparing the garden and planting; June: planting, transplanting, start of watering; July: planting, watering, weeding, harvesting of the first crops; August/September/October: watering, weeding, harvesting and November/December: harvesting, preparing the fields and planting staples (transformation of gardens to crop fields).

The working calendar shown in figure 8 is based on that developed by Jaeger and Huckabay (1986) for wet-season cropping of termitaria fields in Lusaka. In principle, wet-season cropping in other parts in town follows the same calendar; even the crops are the same. New crops of importance were added to the calendar, as well as data on dry-season gardening derived from field observations. As it was not possible to mention all the plants cultivated in the dry season, only the most important ones are indicated. Figure 8 shows that the agricultural cycle continues year-round. Wet-season farming starts with field preparation in mid-November, just before the first rains are expected. At this time, watering

Figure 7, Percentage of respondents practising urban (vegetable) gardening

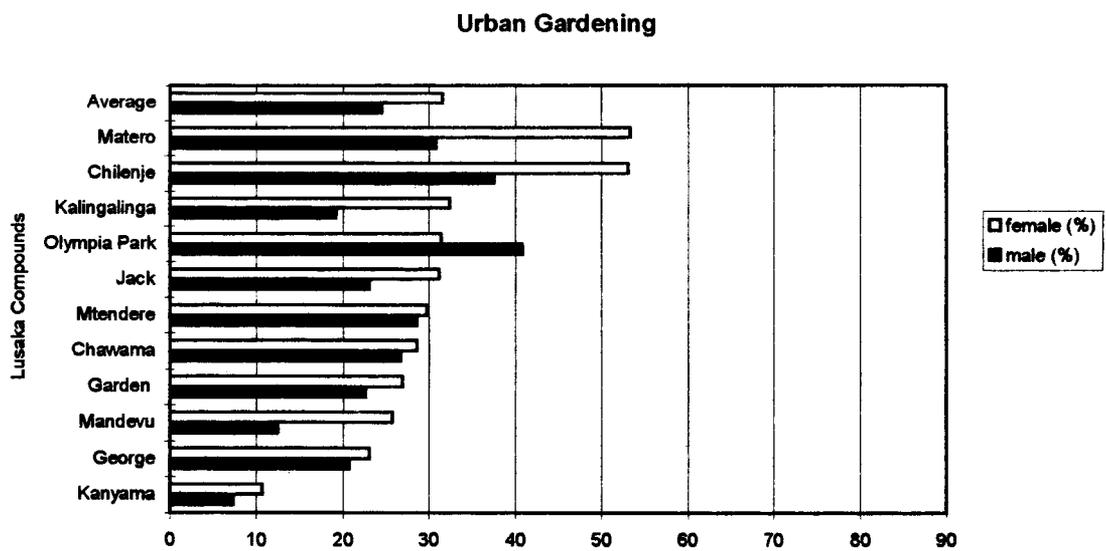
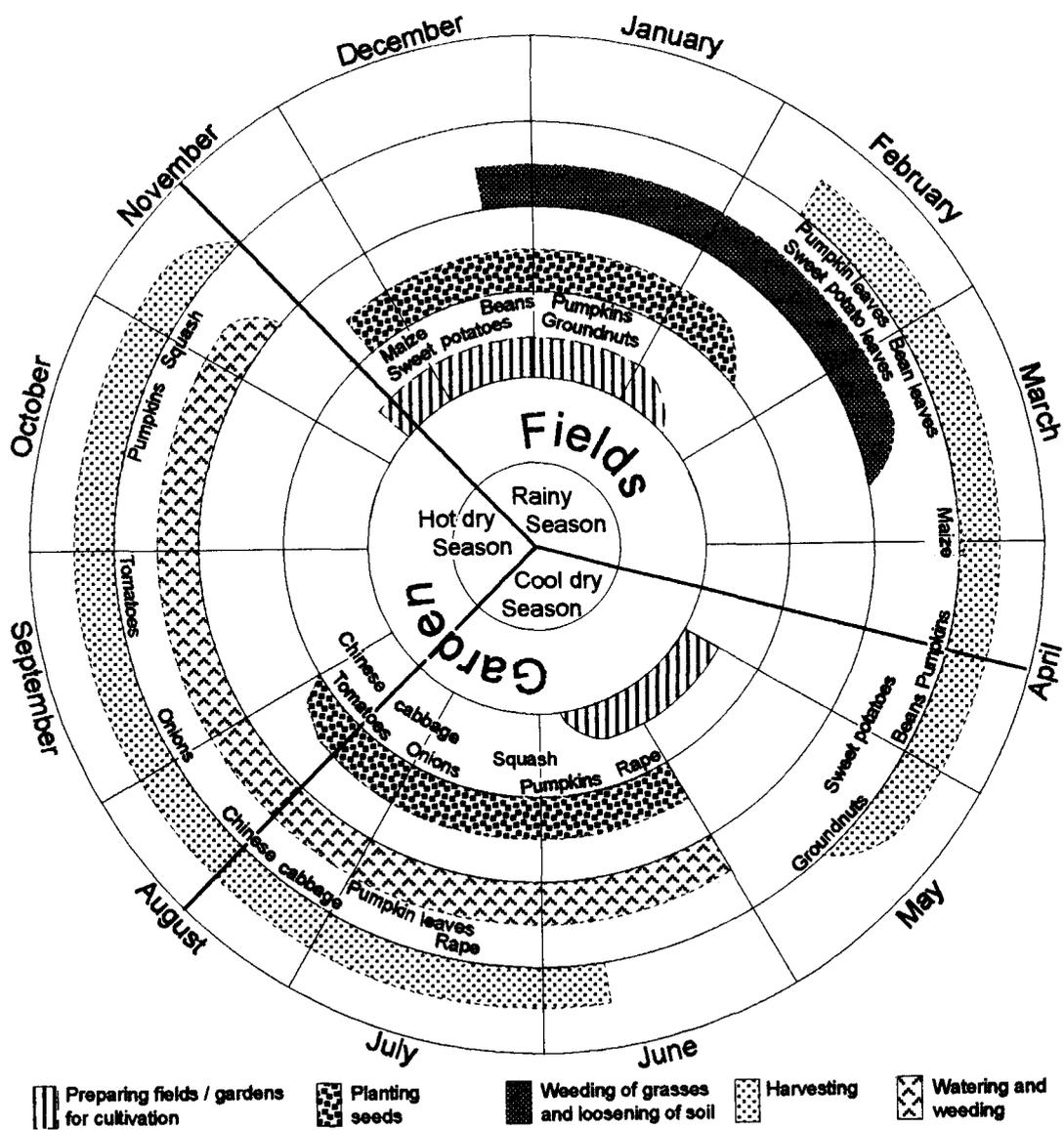


Figure 8, Working calendar for urban micro farming in Lusaka, Zambia



NB: Design and data on wet season adapted from Jaeger and Huckabay (1986) and compiled with gardening data from field observations

and weeding of the gardens stops and the last crops are harvested. After the rains have stopped in April/May, the preparation of the gardens starts. Some gardeners start earlier, some later, depending on labour availability and the yield of the wet-season crops. If the yield was good, people start gardening later; some explained that they were tired of fieldwork after the rainy season. December and January are difficult months with respect to food security. Garden products and staple food reserves came to an end, and the field crops are not yet ready to be harvested. Leafy vegetables are always the first to appear in the cycle: leaves of pumpkin, bean and sweet potato in the wet season (available beginning of February) and leaves of rape and pumpkin in the dry season.

### Land Availability and Dry Season Water Supply

Space and water supply are the basic requirements for garden activities. Inside the urban centre, the gardens are mostly on the house plot but sometimes off-plot along a path or dust road. The garden area mainly depends on the size of the houseplot, and varies from 70 to several hundred square metres. The ill-defined land tenureship and the illegal character of some of the urban compounds partly explain the insufficient availability and/or security of resources such as land and water. These legal aspects represent a major limitation to agricultural activities. Peri-urban agriculture is also being limited by the sprawl of official and unofficial residential areas and commercial activities. Already, Schultz (1976) pointed out that the "ring of cultivation" around the central urban zone is likely to be pushed outwards by this process of urban expansion. Schlyter's very detailed study of George Compound, Lusaka showed how this process destroys land for gardening inside townships (Schlyter, 1991). The only areas where farming has increased is where roadstrips were created by road construction (although also this type of farming is illegal). At the same time, population pressure on resources is increasing and will probably cause serious social problems in the future. According to Schlyter (1991), in 1969 61 percent of the residents of Old George Compound practised gardening on plots of about 40 m<sup>2</sup> average size. This figure has significantly decreased to 42 percent gardeners in 1989, cultivating plots of 12 m<sup>2</sup> average size only. Results of our survey showed that only about 20 percent of the respondents in this township now have gardens. Many gardens disappeared because of the increasing population, the building of infrastructure and changes in the construction pattern (figure 9).

Availability of water is one of the main limits to gardening. Water from various sources is used. In urban areas, piped home water, (communal) taps and (communal) wells are most common. In Lusaka, a strong relation can be found between the economic standard of the township and the type of water supply: in poorer townships, there is either communal water supply or none at all, and people try to help themselves by digging wells, where possible.

The water supply of Lusaka is incumbent upon the Lusaka Water and Sewerage Company, which has the duty to deliver water throughout the town and to organise the sewage system. Nearly half of the water comes from the Kafue River, 60 km

south of Lusaka. The other half comes from boreholes in and near the town. In principle, the supply system is designed to serve a maximum of 300,000 people. The company has about 35,000 registered clients, or 3 percent of the town population. Nearly half of the water is lost on its way to the clients, either by leakage or theft. More than 80 percent of the population uses water without payment, also for watering gardens. The water supply is irregular and unreliable and, during drought periods, it is liable to break down. In 1992 a large part of the population of Lusaka was on a mass movement in search of water. The average size of the gardens in the survey area of Lusaka is 184 m<sup>2</sup> across all samples, with a large range from 17 to 865 m<sup>2</sup>. Nearly 90 percent of the gardens are less than 300 m<sup>2</sup> (55 percent less than 150 m<sup>2</sup>) and all of them are generally very near (< 20 m) the house. One main group of non-gardeners could be identified: urban inhabitants of townships with high population density.

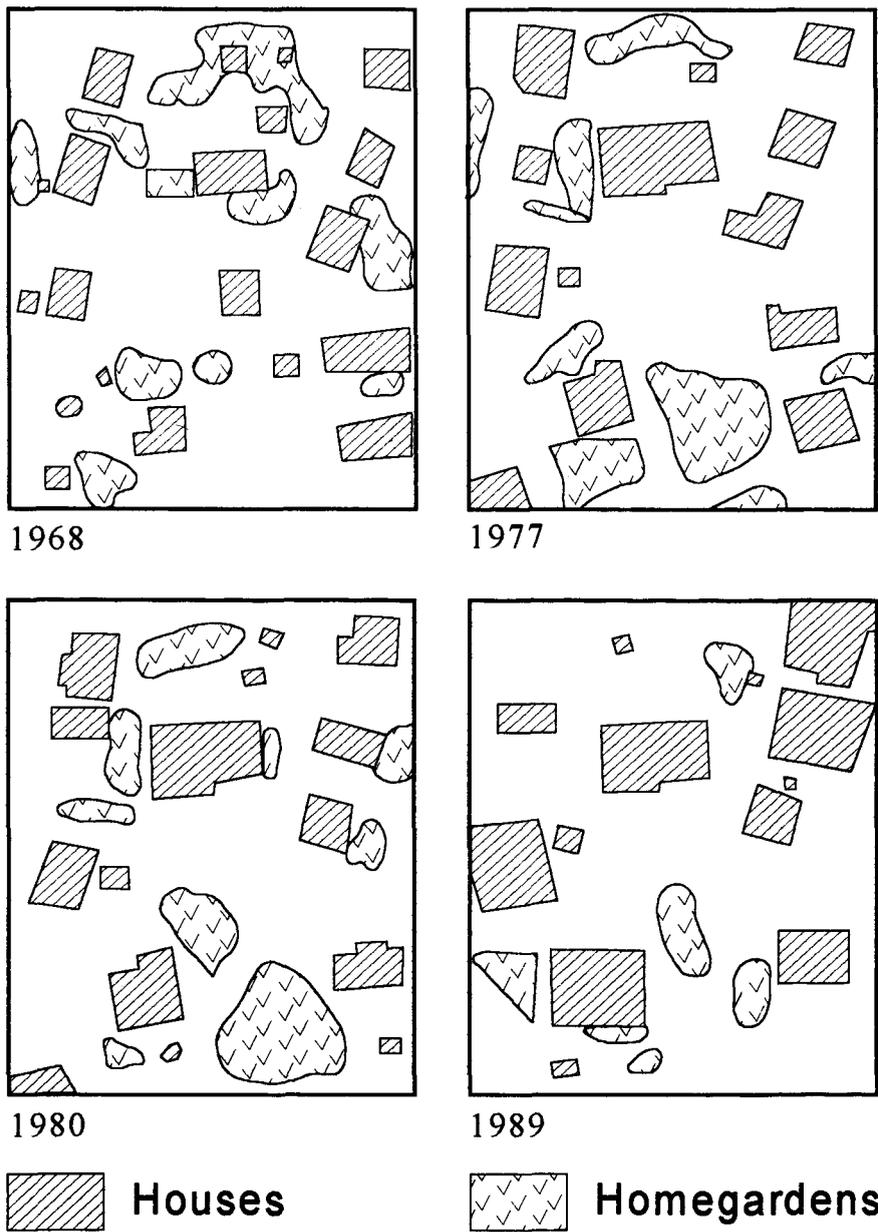
The case of Kanyama is a striking example for the limited access to basic resources like land and water. This township is one of the most densely settled areas of Lusaka, without outdoor space and water for gardening and with very limited land resources for wet-season farming because of the rock outcrops. This example also shows how the 'poorest of the poor' are cut off from basic needs like gardening because of limited resources. Household gardening as a coping strategy for survival cannot be practised here. Even if tools, money and seeds were available, these families would remain vulnerable because of limited land and water resources. Another group of non-gardeners are Female Headed Households (FHH). This group is underrepresented in our survey. This indicates that FHH are not much involved in gardening in Lusaka. Literature shows, that there is a disproportionate representation of FHH in the group of livestock keeping households in rural areas in Zambia (Carr, 1991). Beyond that, it seems that due to serious labour constraints, FHH generally concentrate more on activities which can be carried out near the house but do not require too much work.

### Other Constraints: Input Resources, Skill Development, Theft

Seeds for the garden are obtained from different sources: last season's harvest; purchased (from commercial institutions, NGOs, street vendors or other households); gifts. Exotic vegetables dominate in gardens, and most of the households buy these seeds. Urban gardeners depend on purchased seeds only, or on a combination of last season's seeds and purchased seeds. Very rarely do they use only seeds collected from previous harvests. More than 75 percent of the respondents use animal dung to fertilise the vegetable garden. Less than 45 percent use mineral fertilisers. Use of compost is uncommon. A few people try to prepare some sort of compost, but generally the quality is very low, because all kinds of garbage are mixed with the organic matter. Inside town, poultry is kept by about 55 percent of the respondents. Animal husbandry does not appear to play an important role within the group of homegardeners, but this does not exclude animal husbandry as an important urban activity. The survey

Figure 9, Decrease of gardens in George Compound from 1969 to 1989

### George - Compound / Lusaka



(Source: Adapted from Schlyter, 1991)

was designed to cover gardeners rather than people practising other forms of urban microfarming, such as livestock keeping.

Gardening requires specific skills to bring knowledge into practice. Since many plants found in the gardens differ from those found in the wet-season fields and include exotic crops, the development and/or acquisition of relevant knowledge and skills is important to urban gardeners. For all the households in the survey, parents and relatives are extremely important sources of experience. Schools or courses are second in importance. Own experience (experimenting) is another important feature. Extension workers do not play an important role in conveying knowledge about gardening. It seems that this activity is barely noticed by the extension services.

More than one-third (38 percent) of the urban respondents had problems with theft of their produce. Urban women are more affected by theft. Forty-seven percent complain about it while only 29 percent of men do. The frequency of theft increased with greater distance of the garden from the homestead. Similar observations were made by Jaeger and Huckabay (1986). Some households have found ways of preventing theft: fencing to make the garden less accessible and even sleeping in the garden to guard it during the harvesting period. In general, the respondents find it difficult to take measures against thieves because of the relationships and commitments between people in the quarter and because of the fear of witchcraft.

### Homegarden Output and Income Generation

All the households stated that garden produce is used mainly for home consumption. Sixty-seven percent of the urban households sell part of the products to get additional income, and nearly 100 percent give some of the produce away. Gifts to other households are a common way of maintaining good relations and help to strengthen the 'social security' network of the household. Comparing the above-mentioned farmers' information with our field observation and measurement of individual plants in the gardens it is assumed that indeed more than 50 percent of the urban gardeners produce is partly market oriented. The main food plants found in the gardens are vegetables and fruits (table 6). Tomatoes were found in 74 percent of the gardens, followed by rape (67 percent), chinese cabbage (59 percent), onions (50 percent), pumpkins (41 percent), maize (35 percent), sweet potato (27 percent), cabbage (24 percent), sugarcane and spinach (23.5 percent). Less important are carrots, beans and lettuce. Most important fruit trees are papaya and mango (32 percent), followed by peaches (23.5 percent) and lemon (14.7 percent).

Income is generated by marketing some garden products. The strategies vary: Direct sales to neighbours, barter, and sales on wholesale or retail markets. Only 17 percent of the gardeners sell on markets. The following reasons were given for not doing this. "Do not produce enough". The households have small gardens and produce just enough to feed the family. Any surplus is not big enough to be sold at the market. The surplus is sold or given to neighbours, relatives or friends. "Problems with marketing" was mentioned mainly by female gardeners, who referred to problems of lack of transport, lack of time, distance to market or lack of market. It is quite difficult to obtain precise information on income earned from the garden, for various reasons, namely, the gardeners do not sell regularly and therefore do not have a regular income over the year; the cash earned is often spent immediately at a market or nearby shop; people do not like to tell how much they earn, often because they are afraid of other people's jealousy; not everything is sold for cash, part of the produce is also bartered, e.g. for clothes; and because harvesting is continuous, it is difficult to estimate yield.

In most cases, income from gardening is not spread over the entire year. It is restricted to the dry season. However, if the information given by respondents is expressed in terms of income per month, people selling on markets have an average income of about ZK 11,700/month and non-market sellers about ZK 5,700/month. At the time of the survey, the exchange rate was ZK 560 to US\$ 1. Thus, at least US\$ 20 per month could be gained by gardeners who sold on the market. There are considerable differences in the income gained by women and by men: the average income of women is nearly ZK 9,100/month while the average income of men amounts to ZK 15,500/month. The households selling on the market earned more money than those doing informal marketing. This can be explained by the fact that people start going to the market only when they produce enough to make this worthwhile. The figures presented here are rough and there are some doubts about the reliability of the data, as they are based only on gardeners' responses, but they give at least an indication of the contribution of gardening to household income. The market survey carried out in 1992 and 1993 proved that prices on the retail market in high density squatter areas are much higher for some products (e.g. tomatoes and onions) compared to other markets. Vennetier (1988, cited by Mougeot, 1994) considers the microretailing of food as a strong price-hiking factor in African cities. This is caused by the complex marketing system and the low purchasing power of the poor retail marketers. Consequently, the access to food of the poor household is reduced. The main problem for these people is

**Table 6, Homegarden Produce**

Choumoulier/Kale	<i>Cleome gynandra</i>	Watermelon	Shallots
Rape	<i>Amaranthus</i> spp.	Pumpkins	Onions
Cabbage	Green beans	Baby marrow	Lettuce
Chinese cabbage	Green pepper	Spinach	Papaya
Cauliflower	Irish potatoes	Tomatoes	Peaches
Sugarcane	Sweet potatoes	Cassava	Mango
Maize	Chilli	Carrots	Lemon

Source: Compiled by the author

access to land and water. Population pressure is very high in these townships, leaving almost no space for gardening. Access to land in the environs of the townships is restricted by physical conditions, such as rock outcrops, which make soil cultivation impossible. Land availability is further restricted by uncertain land tenureship. Those households are not able to create neither the buffer of homegardens nor the staple food production for household food security.

### Recommendations for Further Research and Action

Although urban microfarming appears to bring advantages to the household as a whole, little is known about the actual distribution of the food and income among household members. Further research into this is needed in order to determine the nutritional impact of microfarming, preferences of urban consumers and impacts of possible changes in diet on nutrition. More insight is needed into the actual decision-making among household members about microfarming. It will be important to gain a better understanding of control of resources used in these activities and control of income from them. In-depth interviews or case studies could be appropriate methods for investigating such issues (Bos, 1994; Drescher and Bos, 1994; Dennery, this issue). Through the fieldwork, it was noticed that illness seriously affects agricultural productivity and the capability of poor families to cope with problems. Many illnesses such as malaria are still prevalent, and AIDS is on the increase. This can seriously affect the functioning of the households. More research is needed into the relationship between illness and household economy (Bos, 1994). It is vital to any understanding of household coping strategies and, ultimately, to the effective design of food-security strategies that the relative importance of different income sources, their seasonal fluctuations, and sustainability, as well as the responses of individuals and households, be well understood (Maxwell and Smith, 1992). Policy decisions should no longer revolve around external modernisation (and commercialisation) of small-scale agriculture, but rather face the questions of how to integrate appropriate technologies and new management strategies. Schulthes (1992) defined integration as the key to successful management and clearly points out how difficult this appears to national bureaucracies. Legalising squatter townships and the establishment of site-and-service- and upgrading-projects are possible ways of integration, as proposed by Gaebe (1994: 570–576). The questions and, still more important, the answers of the microfarmers themselves to their problems can significantly contribute to understanding and improving their practices and systems (Drescher, 1994).

Many authors agree upon the need for more research on urban microfarming. Some essential questions are: the quality and quantity of urban resources for microfarming: access to resources (land tenureship, who cultivates where), quality and quantity of water resources, availability of land, access to arable land, quality of intra-urban soils; ways of promoting a 'self-help' approach to resource management and cooperation between urban microfarmers; how to change policy attitude towards urban microfarming: appropriate town planning, support programmes for gardening, provision of

extension services for urban smallholders, improvement of water supply in townships; regional or even local differences in urban microfarming: case studies of different towns to look at the possibilities of microfarming, inputs and outputs, problems and potentials; ecological impact of urban microfarming: benefits and disadvantages, utilisation of waste and sewage for microfarming purposes; and the gender issue: the role of women in microfarming and household food security in the urban environment, coping strategies of female-headed households, intrahousehold allocation of resources, intrahousehold distribution of food and income, motivations, decision-making processes, relationship between illness and household economics.

One most crucial point is the perception of unimportance of urban agriculture, which is a psychological problem of the decision makers in policy and councils. Therefore awareness-creating of decision makers and empowerment of city farmers is the first step to improve the situation. Even city farmers are not aware of the importance of their activity for urban food security. This seems to be one of the reasons for the relatively small output of this system. Promotion of urban agriculture presumes action on different levels: the farmers themselves (empowerment and training), the extension level (training) and the decision makers and urban planners (changing perception and creating awareness). Transfer of research findings to implementing authorities and decision makers stipulates beforehand close contacts between the two parties. Therefore decision makers are one important target group for special workshops on urban agriculture. There is urgent need of a different approach to support female urban farmers. This group needs special attention through well trained extension services and external support structures like e.g. credit facilities. Future action should therefore include workshops on urban agriculture and food security for decision makers and planners, farmers and extension services. 'On garden' research is one important step towards empowerment of urban smallholders. This fact got obvious during fieldwork in Lusaka. Therefore more research with a participative extension approach is needed in this field. One step further can be the support of small-scale enterprises for vegetable production on commercial basis and the establishment of appropriate training institutions for vegetable gardening.

The basis for urban microfarming is the availability of resources. The potential for developing the urban agricultural sector is high. In most cases, the formal economic sector in urban centres of the tropics is underdeveloped and, as a consequence, does not provide adequate income for the urban dwellers. Urban microfarming offers an alternative activity and a buffer for household food security. It is based on traditional activities of the indigenous people, and is only now being discovered by development agencies and policymakers as a possible tool for development. The intra-urban land-use systems and, more important, the socioeconomic and sociocultural framework of microfarming as part of the urban food security system are highly sensitive issues. Therefore, any actions initiated from outside have to be discussed carefully with all stakeholders.

## References

- Bos, F. (1994). *The Role of Household Gardens in Household Food Security*. Reeks publikaties van de vakgroep Huishoudstudies, No. 14. University of Wageningen.
- Bowa, M. et al. (1979). *Gardening in the City*. Lusaka: Zambia Institute of African Studies, University of Lusaka.
- Brownrigg, L. (1985). *Home Gardening in International Development: What the Literature Shows*. Washington DC: League for International Food Education.
- Carr, M. (1991). *Women and Food Security—The Experience of the SADCC Countries*. IT-Publication.
- Deutsche Stiftung für International Entwicklung/ Arbeitsgemeinschaft für Tropische und Subtropische Agrarforschung (1994). *Vegetable Production in Peri-Urban Areas in the Tropics and Subtropics: Food, Income and Quality of Life*. Summary Report on Workshop held in Zschortau, Germany, from November 14 to 17.
- Drescher, A.W. (1994). *Urban Agriculture in the Seasonal Tropics of Central Southern Africa: A Case Study of Lusaka/Zambia*. Contribution to the "International Policy Workshop on Urban Agriculture: A Growing Development Tool", University College London (NRI/CPU), 29 June.
- Drescher, A.W. (1995). *Afrikanische Hausgärten als Gegenstand angewandter physisch: Geographischer Entwicklungsforschung*. APT Reports No. 1. Dept. of Applied Physiogeography of the Tropics and Subtropics (APT), Institute for Physical Geography, University of Freiburg.
- Drescher, A.W. and F. Bos (1994). *Report on the Zambian Homegarden Project and the Rural Household Food Security Survey*. Publication of the FAO Project FAHNIS "Food, Health and Nutrition Information System", Lusaka, Zambia.
- Due, J.M. (1985). *Women made Visible: Their Contributions to Farming Systems and Household Incomes in Zambia and Tanzania*. Illinois Agricultural Economics Staff Paper, Urbana.
- ENDA-Zimbabwe (1994). *Urban Agriculture in Harare*. Harare: Report on an IDRC-Supported Project.
- Frankenberger, T.R. (1992). *Indicators and Data Collection Methods for Assessing Household Food Security*. Tamnal College of Agriculture, University of Arizona, unpublished report.
- Fresco, L. (1985). "Vrouwen en Voedselvoorziening. Hoofdstuk 6", in *Honger op ons Bord: Over Politiek en Voedselveiligheid*. Amsterdam: Evert Vermeer Stichting.
- Gaebe, W. (1994). "Urbanisierung in Afrika, *Geographische Rds* Vol. 46 No. H.10.
- Greenhow, T. (1994a). *Urban Agriculture in Lesotho, Botswana and Sweden: Some Brief Observations*. Stockholm: Swedeplan.
- Greenhow, T. (1994b). *Urban Agriculture: Can Planners Make a Difference?* Ottawa: Cities Feeding People Series Report 12. International Development Research Centre.
- Hardon-Baars, A.J. (1990). "Household Systems Perspective to Agricultural Research and Development: A Missing Link". In *User's Perspective With Agricultural Research and Development (UPWARD)*. Baguio City, Philippines.
- Jaeger, D. and J.D. Huckabay (1986). "The Garden City of Lusaka: Urban Agriculture", in Williams, G.J. (ed.) *Lusaka and Its Environs*. Lusaka: Geographical Society of Zambia.
- Lamba, D. (1993). "The Neglected Industry of Kenyan Cities", *IDRC Reports* Vol. 21 No. 3.
- Lee-Smith, D. and D. Lamba (1991). "The Potential of Urban Farming in Africa", *ECODECISION*, December.
- Maxwell, D.G. (1994). "The Household Logic of Urban Agriculture in East Africa", in A.G. Egziabher et al. (eds) *Cities Feeding People: An Examination of Urban Agriculture in East Africa*. Ottawa: International Development Research Centre.
- Maxwell, D.G. and S. Zziwa (1992). *Urban Agriculture in Africa: The Case of Kampala, Uganda*. Nairobi: African Centre for Technology Studies.
- Maxwell, S. (1990). "Food Security in Developing Countries: Issues and Options for the 1990s", *IDS Bulletin* Vol. 21 No. 3.
- Maxwell, S. and M. Smith (1992). *Household Food Security: A Conceptual Review*. Sussex: IDS.
- Mougeot, L.J.A. (1993). "Urban Food Self-Reliance: Significance and Prospects", *IDRC Reports* Vol. 21 No. 3.
- Mougeot, L.J.A. (1994). *Urban Food Production: A Survey of Evolution, Official Support and Significance (With Special Reference to Africa)*. Paper Presented at the "Habitat '94", Edmonton, September 20.
- Purseglove, C. (1985). "A Household Economic Approach to Malnutrition and Poverty in Rural Africa", in Badir D.R. (ed.). *Proceedings of the First All Africa Home Economics Meeting*. Accra, Ghana.
- Purseglove, J.W. (1988). *Tropical Crops: Monocotyledons*. Essex: Longman

- Ratta, A. and J. Smit (1993). "Urban Agriculture: It's Much More than Food", *Why Magazine*. No. 11.
- Sanyal, B. (1985). "Urban Agriculture: Who Cultivates and Why? A Case-Study of Lusaka", *Food and Nutrition Bulletin* Vol.7 No. 3.
- Schilter, C. (1994). *Possibilities and Limits of Urban Agriculture (the Case of Lomé)*. Paper Presented at the "International Policy Workshop on Urban Agriculture: A Growing Development Tool". University College London (NRI/CPU), 29 June.
- Schlyter, A. (1991). *Twenty Years of Development in George, Zambia*. Stockholm: Swedish Council for Building Research.
- Schlyter, A. and T. Schlyter (1980). *George: The Development of a Squatter Settlement in Lusaka, Zambia*. Stockholm: Swedish Council for Building Research.
- Schulthes, J. (1992). "Neuorientierung in der Ernährungssicherung", *Entwicklung + Ländlicher Raum* 4.
- Schultz, J. (1976). "Land-Use in Zambia: Part I: The Basically Traditional Land Use Systems and Their Regions. Part II: Landuse Map". *Afrika Studien* 95, Weltforum Verlag, München.
- Smit, J. et al. (1996). *Urban Agriculture : Food, Jobs and Sustainable Cities*. New York: UNDP.
- Streiffeler, F. (1993). *General Principles and Approaches for Sustainable Urban Greenbelts with Special Reference to Africa*. FAO report.
- Streiffeler, F. (1994). *Social and Political Problems of Urban Agriculture*. Contribution to the International Expert Consultation on "Vegetable Production in Peri-Urban Areas in the Tropics and Subtropics: Food, Income and Quality of Life", held from November 14 to 17, 1994, in Zschortau, Germany.
- Thomson, B.P. (1954). *Two Studies in African Nutrition; An Urban and a Rural Community in Northern Rhodesia*. Manchester: The Rhodes-Livingstone Papers, No. 24. Manchester University Press.
- The Urban Agriculture Network (1994). *Urban Agriculture Information Brief*. Washington DC: The Urban Agricultural Network.
- van der Berg, L. (1982). *In the Shadow of Lusaka: Land and People under Pressure of Urban Growth*. Lusaka: Studies in Zambian Society, 6. University of Zambia.
- van der Blik, J.A. (1992). *Urban Agriculture: Possibilities for Ecological Agriculture in Urban Environments as a Strategy for Sustainable Cities*. Netherlands, Leusden: ETC.
- Vennetier, P. (1988). "Urbanisation, production agricole et autosuffisance alimentaire: Réflexions sur le Cas Africain", *Cahiers d'Outre-Mer* Vol. 41 No. 63.
- Zambia, Government of (1990). *Zambia in Figures*. Lusaka: Central Statistical Office.
- Zambia, Government of (1992). *Zambia in Figures*. Lusaka: Central Statistical Office.

estudios de  
**ASIA**  
y  
**AFRICA**

VOL. XXXII, SEPTIEMBRE-DICIEMBRE, 1997, NÚMERO 3

**104**

ARTÍCULOS

Elisabetta Corsi

*Términos chinos utilizados como sinónimo de "perspectiva" y los ecos del naturalismo en algunos textos sobre pintura del siglo XVIII*

Hilda Varela

*"¡Noche de gran luna y destino ignorado!". La historia política de la República de São Tomé y Príncipe (1975-1996)*

Romer Cornejo Bustamante

*Confucianismo y desarrollo económico*

Simone A. Nguyen Dac

*Economía rural vietnamita: Quinto plan quinquenal (1991-1995)*

ESTUDIOS DE ASIA Y ÁFRICA es una publicación cuatrimestral de El Colegio de México, A.C. Suscripción anual en México: 100 pesos. Estados Unidos y Canadá: individuos, 20 dólares; instituciones, 30 dólares. En Centro y Sudamérica: individuos, 20 dólares; instituciones, 30 dólares. En otros países: individuos, 25 dólares; instituciones, 35 dólares. Si desea suscribirse, favor de enviar este cupón a El Colegio de México, A.C., Departamento de Publicaciones, Camino al Ajusco 20, Pedregal de Santa Teresa, 10740 México, D. F.

Adjunto cheque o giro bancario núm.: \_\_\_\_\_

Por la cantidad de: \_\_\_\_\_

A nombre de El Colegio de México, A. C., como importe de mi suscripción por un año a ESTUDIOS DE ASIA Y ÁFRICA.

Nombre: \_\_\_\_\_

Dirección: \_\_\_\_\_ Código postal: \_\_\_\_\_

País: \_\_\_\_\_ Estado: \_\_\_\_\_ Ciudad: \_\_\_\_\_

**EL COLEGIO DE MÉXICO**

## EPURATION ET RÉUTILISATION DES EAUX USÉES DOMESTIQUES EN MARAÎCHAGE PÉRIURBAIN À DAKAR, SÉNÉGAL (Purification and Re-Use of Domestic Wastewater in the Suburbs of Dakar, Sénégal)

Seydou Niang

Chercheur à l'Institut Fondamental d'Afrique Noire (IFAN) Ch.A.DIOP Dakar, Sénégal

### Résumé

Accepted January, 1996

Depuis son apparition au Sénégal en 1937, le maraîchage a globalement connu une évolution, tant sur le plan des surfaces utilisées que sur le plan des rendements. Malgré tout, les besoins ne sont pas satisfaits et le Sénégal continue à importer des légumes. En effet, avec les années successives de sécheresse, la principale source d'approvisionnement en eau que constituait les Niayes a montré ses limites. Dès lors, les eaux usées se sont présentées pour les maraîchers, comme une alternative assez intéressante pouvant combler le déficit en eau. Les caractéristiques physicochimiques et biochimiques des eaux usées, comparés à ceux des eaux de céanes (puits peu profonds) et à ceux du réseau d'eau potable démontrent que les eaux usées sont très intéressantes pour le maraîchage. L'analyse de l'impact de l'utilisation d'eaux usées dans le maraîchage montre une économie d'eau et d'intrants. Cependant sur le plan bactériologique, les concentrations notées en coliformes et streptocoques fécaux font que ces eaux ne sont pas aptes, selon les normes OMS, à l'irrigation en maraîchage sans restriction. Ainsi, l'analyse parasitologique des légumes arrosés avec des eaux usées brutes montre que ces légumes, prêts à la vente, sont chargés d'œufs et de larves de parasites qui sont capables de transmettre des maladies chez les consommateurs, d'où la nécessité d'épurer les eaux avant réutilisation. En matière de traitement des eaux usées dans les pays en développement, les techniques extensives d'épuration des eaux usées constituent les procédés les plus à la portée des budgets nationaux. Mais du fait de l'utilisation de végétaux dans ces processus d'épuration, les eaux produites sont, suivant la technique utilisée, soit de faible quantité, soit déséquilibrées (rapport azote-phosphore). De plus, comme le montre les résultats obtenus à la station expérimentale de Cambérène, aucun des systèmes étudiés ne respecte les normes bactériologiques de l'OMS pour la réutilisation sans restriction en maraîchage. Les recherches doivent donc s'orienter vers une optimisation de ces techniques d'épuration extensive en vue d'une réutilisation en maraîchage.

**Mots Clés**—épuration, eaux usées, maraîchage, intrants, parasites, coliformes fécaux, lagunage, macrophytes, microphytes, marais

### Abstract

This article reports on an experiment in progress. Since first noticed in Sénégal in 1937, horticulture in the country has grown both in terms of cultivated acreage and crop yields. Nevertheless, demand continues to exceed domestic supply and the country still imports vegetables. With successive years of drought, the main source for water supply for local crops, the Niayes, has reached its limits. Wastewaters are now perceived and used by vegetable growers as a valuable alternative to make up for the deficit from traditional supply sources. Physicochemical and biochemical qualities of wastewaters do put them at a clear advantage for use in horticulture, when compared to deep-well water and that which is supplied by the drinking-water system. An analysis of wastewaters' impact on vegetable farming does point to savings by users in both water and other inputs. However, observed concentrations of coliforms and faecal streptococci make these waters unsuited for unrestricted irrigation of vegetables. Parasitological analyses of crops watered with untreated wastewaters show that ready-for-sale produce is loaded with eggs and larvae of potentially disease-transmitting parasites. These waters therefore should be treated before they are reused in crop irrigation. Land extensive processes are those which remain within the reach of most national budgets, but these make use of vegetable agents and the treated waters, depending on the technique, are produced only in limited quantities or exhibit imbalanced nitrogen-phosphorus ratios. Moreover, as tests at the Cambérène experimental station show, none of the systems studied meets WHO bacteriological norms. Research underway aims at optimising a combination of available techniques to meet horticultural irrigation requirements.

**Key Words**—purification, wastewater, market gardening, input, faecal coliforms, lagooning, macrophytes, microphytes, marsh

### Introduction

C'est en 1937 que le maraîchage a été initié au Sénégal. Cette première opération, portant sur 2.400 hectares, était destinée à la mise en valeur des Niayes (series de dépressions interdunaires le long de la côte Nord du Sénégal) et à

l'installation d'un paysanat (Kane, 1973). Depuis cette date, le maraîchage a globalement connu une évolution, tant sur le plan des surfaces cultivées qui sont passées de 2.400 ha en 1937 à 8.876 ha en 1990, que sur le plan des rendements. En 1960, ils étaient estimés à 10,8 t/ha alors qu'en 1990 ils

atteignaient 17,9 t/ha (Ngingue, 1992). Malgré tout, les besoins ne sont pas satisfaits et le Sénégal continu d'importer des légumes.

Au niveau du pays, la région de Dakar occupe la première place dans cette activité, par la quantité de légumes produite, par leur diversité et par le nombre des exploitants. De 1.000 hectares effectivement mis en culture maraîchère en 1980 (Delvaque, 1980), la surface exploitée est passée à 2.506 ha en 1990 pour une production de 27.279 tonnes (Ngingue, 1992), soit 18 percent de la production nationale.

Deux secteurs se partagent cette production:

- le secteur traditionnel (objet de notre étude): c'est le plus important (90 percent de la production légumière du pays) (Ngingue, 1992);
- le secteur moderne.

Depuis l'origine, la zone des Niayes a toujours constitué, à partir des mares qui étaient disséminées un peu partout, la principale source d'eau utilisée pour le maraîchage. Après les années successives de sécheresse que le Sénégal a connues récemment, seules les céanes (puits peu profonds) maintenaient cette culture. Cependant, cette eau douce reposant sur une 'loupe' d'eau salée ne permet qu'une exploitation limitée des céanes, sous peine de pollution irréversible.

Actuellement, sous l'influence combinée de la pression urbaine, de la baisse des ressources en eau (suite à la sécheresse) et de celle de la fertilité des sols (trop exploités et pas assez amendés), la production est en nette diminution par rapport aux autres régions (Ngingue, 1992).

A partir de ces dernières années, les eaux usées urbaines, par leur volume de plus en plus important (en rapport avec la croissance démographique de la ville) et par leur richesse en éléments fertilisants, se sont présentées comme une alternative assez intéressante pouvant combler le déficit en eau des exploitations. Dans certains endroits, elles constituent l'unique source d'approvisionnement.

Il faut reconnaître que l'utilisation des eaux résiduaires en agriculture est une pratique qui, depuis une vingtaine d'années, s'est considérablement développée, aussi bien dans les pays industrialisés que dans les pays en développement. Cependant, ce sont les zones arides et les régions à longue saison sèche qui ont souvent été les endroits les plus concernés. Les statistiques mondiales sur l'emploi des eaux résiduaires pour l'irrigation (Bartone et Arlosoroff in Mara et Cairncross, 1991) donnent les résultats suivants:

- Johannesburg (Afrique du Sud), 1.800 ha;
- Brunswick (Allemagne), 3.000 ha;
- ensemble des villes de la Chine, 1.330.000 ha;
- Lubhok, Texas (USA), 3.000 ha;
- Calcutta (Inde), 12.500 ha;
- Tunis (Tunisie), 4.450 ha;
- Mexico (Mexique), 90.000 ha.

L'utilisation des eaux résiduaires semble être la résultante de plusieurs facteurs dont les principaux sont:

- la rareté croissante des autres sources d'eau;
- le coût élevé des engrais artificiels;
- l'acceptation socioculturelle de cette pratique;
- la difficulté relative à convaincre les exploitants des risques encourus.

Malgré tout, cette pratique pose un grave problème de santé publique. De manière générale, il existe quatre catégories de personnes sur qui l'utilisation agricole des eaux résiduaires fait peser un risque potentiel:

- les exploitants agricoles travaillant dans les champs et les membres de leur famille;
- les manutentionnaires des produits de la récolte;
- les consommateurs;
- les personnes vivant à proximité des champs (Bartone et Arlosoroff in Mara et Cairncross, 1991).

Des cas concrets de foyers épidémiologiques imputables à cette pratique peuvent être cités à travers le monde. Pour exemple, en 1987, une épidémie de fièvre typhoïde et paratyphoïde A et B a éclaté dans la région de Dakar. 400 cas étaient répertoriés. Les enquêtes épidémiologiques ont alors révélé que les responsables de la contamination étaient des maraîchers qui utilisaient des eaux insuffisamment (ou pas du tout) traitées pour arroser leurs légumes (Fall, 1992).

Simplement interdire cette pratique ne serait pourtant pas une démarche facile à envisager car, outre le fait que l'interdiction ne ferait que rendre plus difficile la surveillance et la réglementation sans résoudre le problème, elle occasionnerait, dans la conjoncture économique actuelle, d'énormes difficultés économiques pour cette frange de la population et pour les pays concernés.

La solution serait alors de légaliser le système pour mieux le contrôler et minimiser les risques. Pour cela, un certain nombre d'actions sont nécessaires:

- le traitement des eaux résiduaires avant réutilisation (dans le cas où un réseau d'égout existe) par des techniques dites extensives économiquement abordables;
- la limitation de la réutilisation des eaux usées à certaines cultures qui sont les moins sensibles à la transmission des maladies (arbres fruitiers);
- la modification de la méthode d'irrigation; en effet, on peut éviter la méthode d'irrigation par submersion (arrosiers, asperseurs...) et faire adopter des méthodes d'épandage plus hygiéniques (épandage souterrain);
- la limitation de l'exposition humaine par une éducation en matière d'hygiène et par le port de bottes et de gants.

Ainsi, non seulement les risques sanitaires seraient atténués, mais les productions pourraient aussi être augmentées et les ressources en eau potable économisées.

A Dakar, une partie des eaux usées brutes rejetées est récupérée et directement réutilisée pour le maraîchage. Les produits issus de cette pratique culturelle sont revendus indistinctement dans tous les marchés de Dakar, si bien que toute la population de cette ville est concernée par les mêmes risques.

Notre étude s'intéresse à l'impact de l'utilisation des eaux usées urbaines sur la pratique culturelle et sur la qualité sanitaire des légumes produits.

Dans la première partie de l'étude, nous présentons les caractéristiques des différents types d'eaux utilisées pour l'irrigation de maraîchage et l'impact de l'utilisation des eaux usées urbaines sur:

- les besoins en eau des maraîchers;
- le choix du type de culture;
- le mode d'irrigation;
- la quantité d'eau utilisée;
- et les besoins en intrants (engrais et produits phytosanitaires).

La seconde partie de l'étude montre l'impact de l'utilisation des eaux usées sur la qualité sanitaire des légumes produits.

La troisième partie montre, à partir des premiers résultats obtenus à la station expérimentale d'épuration des eaux usées par voie naturelle de Cambérène, les limites de réutilisation des eaux traitées en maraîchage. Nous analysons à ce niveau, les perspectives d'avenir pour une réutilisation efficace des eaux traitées.

## Materiels et Methodes

### (1) Utilisation directe des eaux usées brutes dans le maraîchage

(a) **Choix des sites de maraîchage.** Trois points ont été ciblés, regroupant la majorité des maraîchers de Dakar. Ce sont:

- le site de Cambérène-Thiaroye où les maraîchers travaillent exclusivement avec l'eau de 'céane' (puits de 1 à 3 m de profondeur et de 4 à 5 m de largeur);
- le site de Pikine-Niayes où les exploitants utilisent des eaux usées et l'eau de 'céane';
- le site de Ouakam-Aéroport où les exploitants travaillent avec des eaux usées exclusivement, mais où il y a également des maraîchers branchés au réseau d'approvisionnement en eau potable de la SONEES (Société Nationale d'Exploitation des Eaux du Sénégal).

(b) **Procédure d'échantillonnage.** L'enquête s'est déroulée en trois phases:

- une enquête préliminaire d'un jour; elle avait pour but de discuter avec les exploitants sur l'objet du travail, de familiariser les enquêteurs avec les sites; la méthode utilisée était l'entretien informel; elle nous a permis de faire une première évaluation de notre questionnaire et d'estimer la taille de notre échantillon;
- une deuxième enquête, dite pré-enquête, a servi au cours d'une journée à tester le questionnaire; la méthode utilisée cette fois était l'entretien semi-structuré avec un premier questionnaire élaboré sur la base de questions ouvertes;
- enfin, une fois la taille de l'échantillon fixée (à 100 enquêtes par site), le questionnaire réajusté et définitivement fixé à 80 questions, une liste des personnes qui travaillent dans chaque site a été dressée, puis à l'aide d'une table statistique des nombres au hasard, l'échantillon a été choisi; l'enquête se déroula alors pendant cinq jours au rythme de 20 questionnaires par site et par jour.

300 questionnaires ont été administrés dans les sites de Cambérène, Pikine et Ouakam.

Après réalisation de l'enquête, le questionnaire a été codifié et les données traitées à l'ordinateur grâce au logiciel de traitement d'enquête socio-économique 'MAC SS'.

(c) **Prélèvement et analyse des eaux.** Les résultats présentés sur les eaux de céanes proviennent d'analyses faites sur quelques prélèvements instantanés à Cambérène, complétés par des analyses réalisées par le CDH (Centre de Développement de l'Horticulture) au niveau du même site.

Concernant les eaux usées, l'analyse a été réalisée à partir de plusieurs échantillons instantanés et moyens prélevés au niveau du site de Ouakam.

Le pH, la conductivité, le résidu sec, les chlorures, les MES (matières en suspension) la DBO<sub>5</sub> (Demande Biologique en Oxygène), la DCO (Demande Chimique en Oxygène), l'ammonium (NH<sub>4</sub><sup>+</sup>), les phosphates (PO<sub>4</sub><sup>-</sup>), le NKT (azote Kjeldahl ou total) et le Pt (phosphore total) constituent l'ensemble des paramètres étudiés.

### (2) Analyse de la qualité sanitaire des légumes

L'étude est localisée au niveau du site de Ouakam, dans l'enceinte de l'aéroport<sup>1</sup>. Sur des légumes fraîchement récoltés, prêts à la vente, des échantillons sont prélevés. Les échantillons sont rincés dans un récipient contenant de l'eau stérilisée. Puis 100 ml des eaux de rinçage sont prélevés et analysés au laboratoire. Les analyses ont porté sur la contamination parasitologique.

### (3) Epuration des eaux usées par voie extensive

(a) **Principe.** Le principe de l'expérience est basé sur la comparaison de l'efficacité réelle de plusieurs techniques naturelles de traitement des eaux usées (lagunages à microphytes, lagunages à macrophytes, épandage souterrain, épandage en plantations ligneuses,...). Ces différents procédés d'épuration sont placés dans les mêmes conditions d'alimentation en eaux usées et sous le même climat<sup>2</sup>.

La Station Expérimentale de Cambérène (banlieu de Dakar), construite suivant ce principe par le promoteur du procédé, est suivie régulièrement depuis trois ans par une équipe de chercheurs sénégalais en collaboration avec l'équipe de ViVille (cf. notes 2).

(b) **Protocole expérimental.** La station expérimentale est installée sur le site de la station d'épuration classique des eaux usées de Cambérène. Elle reçoit ainsi des eaux usées représentatives des rejets urbains de Dakar. Elle comporte 18 bassins en tôle de 1 m<sup>2</sup> répartis en six cascades de trois niveaux. La station se propose de tester six types de procédés d'épuration des eaux usées urbaines par voie extensive. Les cascades sont régulièrement alimentées en eaux usées prétraitées (dégrillage, dessablage et déshuilage) par une pompe commandée par une minuterie.

Le premier niveau des cascades est représenté par six bassins de stabilisation. Les deuxième et troisième niveaux sont organisés comme suit:

- une cascade plantée, à *Typha australis* L., représentant un marais à *Typha*;
- une cascade plantée, à *Phragmites vulgaris* Schum & Thonn., représentant un marais à *Phragmites*;

- une cascade plantée, à *Pistia stratiotes* L., représentant la prairie flottante à *Pistia*;
- une cascade non plantée, représentant le lagunage à microphytes;
- une cascade plantée, à *Eucalyptus camaldulensis*, représentant l'épandage sous plantation ligneuse;
- une cascade non plantée, représentant l'épandage sur sol nu.

Les quatre premières cascades reçoivent une alimentation en eau par translation au dessus du sol, tandis que les deux dernières sont alimentées par percolation à travers le sol.

## Résultats

### (1) Qualité des eaux d'irrigation

Dans la zone périphérique de Dakar, on observe une activité intense de maraîchage. Trois types d'eau sont souvent utilisés suivant le pouvoir d'achat du maraîcher. Ceux qui ont le plus de moyens sont branchés au réseau d'eau potable, ceux qui en ont moins utilisent soit des eaux de céanes, soit des eaux usées, soit le mélange des deux, suivant la proximité ou non d'un réseau d'égout. Nous avons analysé les caractéristiques physico-chimiques et bactériologiques de ces eaux. Les résultats sont notés dans le tableau 1.

Une eau de bonne qualité destinée au maraîchage doit avoir un pH variant entre 5,5 et 7,5 selon les légumes cultivés. Elle ne doit pas être très salée: le résidu sec et la concentration en chlorures pour une eau douce sont évaluées respectivement à moins de 900 mg/l pour le premier et moins de 600 mg/l pour le second. La conductivité optimale est située autour de 2,500  $\mu$ s.

Pour ce qui concerne la qualité microbiologique des eaux destinées au maraîchage, selon les normes OMS, ces eaux ne doivent pas contenir une concentration en coliformes fécaux supérieure à 1.000/100 ml et une concentration en œufs de nématodes intestinaux supérieure à 1/1.000 ml, pour une irrigation sans restriction.

Sur le plan du pH, de la conductivité et de la concentration en chlorures, les trois types d'eau considérés sont aptes à l'irrigation en maraîchage.

Les eaux usées brutes sont fortement chargées en MES. La conséquence la plus directe est le colmatage de la couche superficielle du sol pouvant aboutir à long terme à une imperméabilisation puis une asphyxie.

La DBO<sub>5</sub> indique la teneur de l'eau en matière organique biodégradable. Comme la dégradation de celle-ci produit à terme des fertilisants tels que l'ammoniaque, les nitrates et les phosphates, les eaux usées présentent sur ce point un réel avantage par rapport aux autres types d'eau d'irrigation.

L'ion ammonium (NH<sub>4</sub><sup>+</sup>) est la forme la plus réduite de l'azote minérale. Sous cette forme, il est assimilable par les bactéries et les végétaux supérieurs. La forte teneur notée dans les eaux usées peut être considérée également comme un avantage pour l'irrigation en maraîchage.

Les phosphates (PO<sub>4</sub><sup>3-</sup>) est assimilable par les bactéries et les plantes supérieures. Sa présence dans les eaux usées est aussi un avantage en maraîchage.

Les concentrations notées en coliformes fécaux et en streptocoques fécaux au niveau des eaux usées montrent,

Tableau 1, Caractéristiques des eaux utilisées  
Table 1, Characteristics of different waters used

Paramètres	Types d'eau d'irrigation		
	Céane	Eaux usées	Eau potable
pH	3 à 8,5	8	7,7
Conductivité en $\mu$ s	400 à 2800	1900	1100
Résidu sec en mg/l	300 à 2100	900	800
Chlorures en mg/l	100 à 1200	400	200
MES en mg/l	20	1200	0
DBO <sub>5</sub> en mg O <sub>2</sub> /l	50	500	2
NH <sub>4</sub> <sup>+</sup> en mg N/l	22	127	1
PO <sub>4</sub> <sup>3-</sup> en mg P/l	0	16	2
Coli. fécaux en N/100 ml	0	2,8.10 <sup>7</sup>	0
Strep.fécaux en N/100 ml	0	1,8.10 <sup>7</sup>	0

suivant les normes OMS, que ses eaux sont inaptes à l'irrigation de maraîchage sans restriction.

### (2) Utilisation des eaux usées dans maraîchage

(a) **Impact sur les besoins en eau.** D'une manière générale (figure 1), plus de 80 percent des exploitants, au niveau des trois sites étudiés, disent ne pas disposer de l'eau nécessaire pour l'irrigation des surfaces disponibles. Malgré tout, les taux de satisfaction les plus importants sont enregistrés chez ceux qui utilisent les eaux usées brutes.

Seuls les exploitants qui utilisent l'eau de la SONEES (Société Nationale d'Exploitation des Eaux du Sénégal) arrivent à satisfaire leur besoin en eau: cela se comprend par le fait que l'acquisition d'un robinet dans la parcelle assure de l'eau en permanence. L'inconvénient lié à cette situation est que cette eau doit être payée assez chère.

(b) **Impact sur le choix du type de culture.** La culture des légumes, celle des arbres fruitiers et l'association de ces deux types de culture sont les pratiques que nous avons observées.

Suivant le mode d'approvisionnement en eau d'irrigation, les exploitants privilégient l'une ou l'autre pratique (figure 2).

Ceux qui s'approvisionnent en eaux de 'céane' cultivent surtout des légumes. Il en est de même pour les exploitants qui utilisent les eaux usées brutes et les eaux de 'céane'. Cette culture, plus rentable à court terme, attire beaucoup plus les exploitants qui peuvent disposer d'un minimum d'eau de 'céane'.

Les maraîchers, qui s'approvisionnent exclusivement en eaux usées brutes, optent pour la culture associée de légumes et arbres fruitiers. Conscients de l'interdiction d'utiliser les eaux usées brutes pour arroser des légumes et contraints par leur situation économique de le faire, par prudence, ils associent les deux cultures pour éviter de se retrouver sans ressource lors d'une éventuelle intervention des Services d'Hygiène.

Notons que les exploitants qui ne cultivent que des arbres fruitiers sont peu nombreux (moins de 10 percent).

(c) **Impact sur le mode d'irrigation.** L'irrigation par aspersion à l'arrosoir, par tuyau souple et par système de canalisation sont les principaux modes d'irrigation rencontrés dans la zone. Le système dominant est l'irrigation par aspersion à l'arrosoir. Cependant, on observe aussi une combinaison de ces systèmes (figure 3).

Les exploitants qui s'approvisionnent en eau de 'céane' utilisent exclusivement l'aspersion à l'arrosoir. Les 'céanes' étant situés en contrebas par rapport aux parcelles cultivées, le transport de l'eau exige un apport d'énergie qui est ici la force musculaire des maraîchers.

Les exploitants qui s'approvisionnent en eau usée brute utilisent en majorité l'aspersion à l'arrosoir, mais 20 percent parmi eux, utilisent les canaux d'irrigation associés à l'arrosoir. Pourtant, les eaux usées pourraient être acheminées au niveau des parcelles par de simples systèmes de canalisation. En réalité, par souci de conservation de cette eau le plus longtemps possible dans la parcelle, les exploitants creusent des trous assez profonds où ils dévient et stockent les eaux usées. Cela les obligent par la suite à utiliser l'arrosoir pour l'irrigation des parcelles.

Les exploitants qui s'approvisionnent à la fois en eau de 'céane' et en eau usée brute, utilisent l'aspersion à l'arrosoir et la combinaison arrosoir-tuyau souple dans les mêmes proportions.

La majorité des exploitants qui s'approvisionnent à l'eau de la SONEES utilisent l'aspersion à l'arrosoir. Nous supposons que ce système est choisi uniquement par souci d'économie de l'eau. En effet, l'eau qui arrive par le robinet a suffisamment de pression pour être transportée par des canaux d'irrigation (tranchées rustiques), ou par tuyau souple. D'ailleurs, la combinaison de l'arrosoir avec le tuyau souple et l'utilisation de ce dernier uniquement, occupent des proportions assez importantes chez ces exploitants.

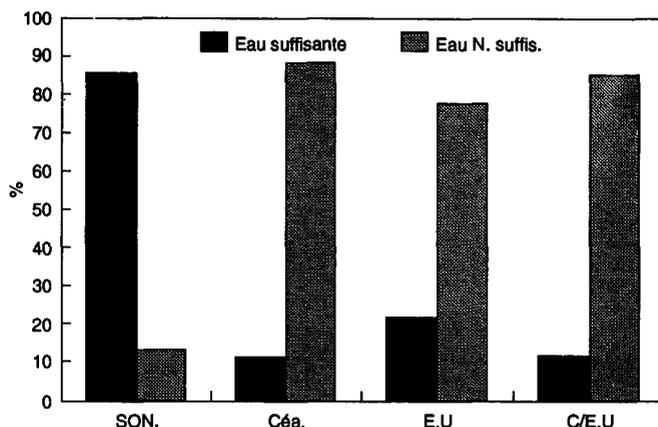
(d) **Impact sur la quantité d'eau utilisée.** La quantité d'eau utilisée semble liée au mode d'approvisionnement en eau. 70 percent de ceux qui s'approvisionnent en eau de 'céane' disent qu'ils utilisent entre 4 et 20 m<sup>3</sup> d'eau par jour, tandis que 86 percent de ceux qui s'approvisionnent en eaux usées disent ne pas dépasser 4 m<sup>3</sup> par jour.

Les surfaces des parcelles cultivées dans le maraîchage a Dakar sont de l'ordre de 500 à 600 m<sup>2</sup> par parcelle (Ngingue, 1992). Les céanes et les chemins nécessaires au transport de l'eau représentent 40 à 50 percent de la surface occupée (Ngingue, 1992). En fin de compte, les surfaces réellement cultivées par parcelle se résument à 200 ou 300 m<sup>2</sup>.

La quantité d'eau utilisée par ceux qui s'approvisionnent en eaux de céanes se situe alors entre 20 et 66 litres par m<sup>2</sup> par jour, tandis que les maraîchers qui s'approvisionnent en eaux usées ne dépassent pas 14 litres par m<sup>2</sup> par jour. Il semblerait donc que l'utilisation des eaux usées diminue la consommation en eau. Selon Beniast et al. (1987), pour un bon maraîchage, il faut 6 à 10 litres par m<sup>2</sup> par jour jusqu'à la récolte. Ceci signifie que le système d'arrosage utilisé ici conduit à un gaspillage d'eau.

Fig. 1, Degré de satisfaction des besoins en eau par mode d'approvisionnement en eau

Fig. 1, Degree of satisfaction of water needs according to the way watered



Source: Compiled by the author

Fig. 2, Type de culture par mode d'approvisionnement en eau

Fig. 2, Type of farming according to the way watered

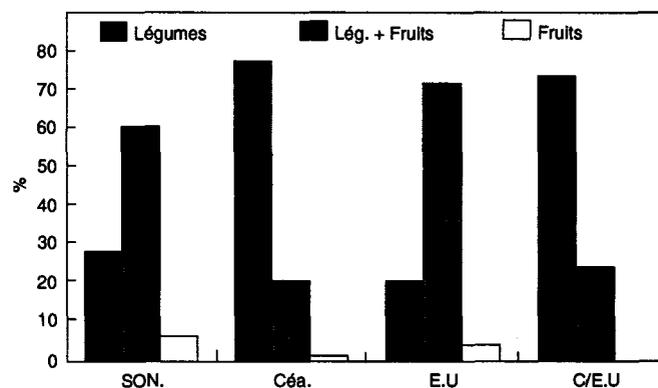
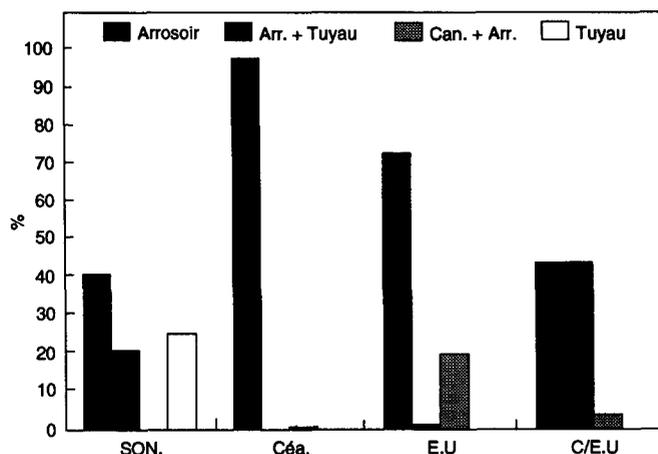


Fig. 3, Mode d'irrigation en fonction du mode d'approvisionnement en eau

Fig. 3, Method of irrigation according to the way watered



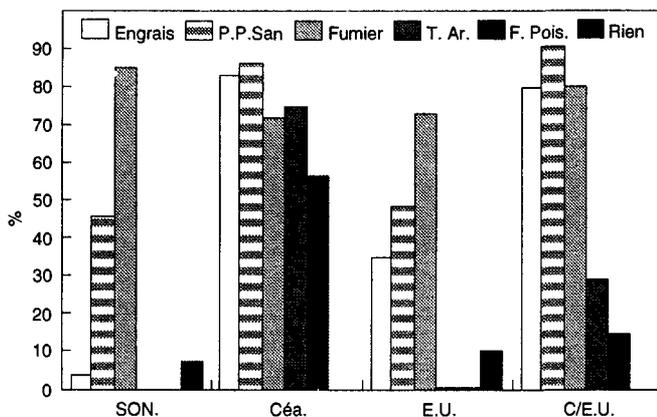
**Légende :**  
 SON : SONEES  
 Céa : Céanes  
 E.U. : Eaux Usées  
 C/E.U. : Céanes + Eaux Usées  
 Eau N. Suffis. : Eau Non Suffisante  
 Lég + Fruits : Légumes + Fruits

(e) **Impact sur l'utilisation des intrants.** De manière générale, les maraîchers, dépourvus de conseils, utilisent mal ou insuffisamment engrais et pesticides. Il n'existe pas de rotation culturale systématique et le traitement phyto-sanitaire toujours curatif, jamais préventif, est souvent effectué trop tard (Ngingue, 1992). Ces conditions conduisent à un rendement au mètre cube d'eau utilisée très inférieur à ce que le climat et le travail dépensé seraient en droit de laisser espérer.

Les engrais chimiques, les fumures organiques (fumier de parc, terre ou poudre d'arachide et fumier de poisson) et les produits phytosanitaires constituent les principaux intrants utilisés.

Il apparaît nettement dans la figure 4 que le taux d'utilisation des intrants est fortement influencé par le mode d'approvisionnement en eau.

Fig. 4, Utilisation des intrants par mode d'approvisionnement en eau  
Fig. 4, Input using by way of watered



**Légende :**  
P.P.San. : Produits Phyto-Sanitaires  
T.Ar. : Terre d'Arachide  
F.Pois. : Farine de Poisson

La richesse des eaux usées en éléments nutritifs constitue un apport assez important. Cela se manifeste chez les maraîchers utilisant ces eaux par une économie nette sur les dépenses en intrants.

### (3) Qualité sanitaire des légumes arrosés à l'eau usée brute

Les analyses portent sur la contamination parasitologique et concerne des légumes qui sont susceptibles d'être consommés crus (laitue, persil, carotte).

L'analyse des résultats présentés dans le tableau 2 montre que certains légumes sont contaminés par des parasites comme les amibes sans temps de latence et à faible dose infectante. Cela veut dire que si ces légumes sont consommés crus et mal lavés, ils sont capables de provoquer aussitôt la maladie chez le consommateur.

L'ankylostome, l'ascaris et le trichocéphale sont des nématodes intestinaux qui ont une période de latence importante et n'ont pas besoin d'hôte intermédiaire pour se transmettre à l'homme. La présence de leurs œufs et larves montre le degré de contamination de ces légumes.

Tableau 2, Concentration en parasites des légumes par 100 ml d'eau de rinçage

Table 2, Parasites concentration in vegetables per 100 ml of rinsing out water

Parasites	Légumes		
	Laitue	Persil	Carotte
Amibe minuta	13 kystes	6 kystes	0
Amibe hystolitica	9 kystes	14 kystes	0
Anguillules	0	20 larves	0
Ankylostomes	2 larves	3 œufs	0
Ascaris	40 œufs	0	0
Levures bourgeonnantes	beaucoup	17	0
Némathelminthes	0	7 œufs	11 œufs
Plathelminthes	0	4 œufs	4 œufs
Trichomonas	13 œufs	12 œufs	3 œufs
Trichocéphale	4 œufs	0	0

Quant aux némathelminthes et plathelminthes, qui sont des parasites nécessitant la présence d'un hôte intermédiaire, leur présence n'est pas pour autant sans danger. En effet, les animaux domestiques qui constituent les hôtes intermédiaires, divaguent dans les maisons et s'abreuvent souvent avec les eaux de rinçage des légumes et mangent leurs épluchures. Comme ces animaux sont consommés par la population, le cycle de contamination est vite établi.

### (4) Aptitudes des eaux traitées pour le maraîchage

La Station Expérimentale de Cambérène se propose avant tout de tester sur place différents procédés de traitements extensifs des eaux usées en comparant les rendements obtenus par chaque système dans les mêmes conditions expérimentales (même climat, mêmes eaux usées, mêmes débits). L'objectif final est cependant, de mettre sur pied une (voire plusieurs) chaîne(s) d'épuration composée(s) d'éléments provenant des différents procédés en expérimentation. Les résultats présentés concernent la disponibilité en eau après traitement et les rendements épuratoires.

(a) **Disponibilité en eau après traitement.** Les résultats concernent la période du 15 février au 10 juin 1994 (pendant la saison sèche); soit 116 jours. Ils indiquent les pertes en eau de chaque système lors de l'épuration.

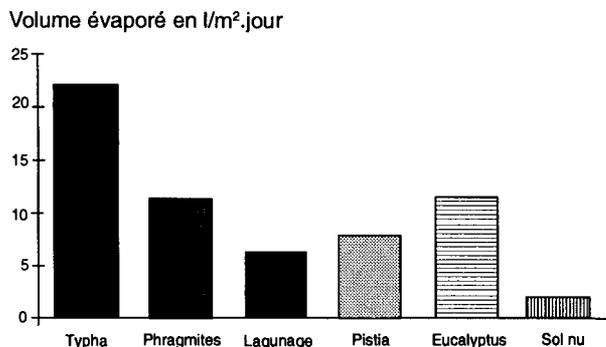
Sur le plan strict de la disponibilité en eau après épuration (figure 5), le système à sol nu offre le plus de possibilité pour le maraîchage. Il est suivi par le lagunage à microphyte puis par la prairie flottante à *Pistia*. Le système à *Typha* semble le moins intéressant sur le plan de la disponibilité de l'eau après traitement.

### (b) Rendement épuratoire des différentes cascades.

L'analyse du tableau 3 montre qu'aucune des cascades expérimentées ne présente un rendement épuratoire supérieur aux autres pour tous les paramètres de pollution considérés.

De plus, certaines cascades produisent une eau traitée déséquilibrée du point de vue du rapport phosphate/azote,

Fig. 5, Evaporation et évapotranspiration moyennes des six cascades  
 Fig. 5, Average evaporation and evapotranspiration of six groups of tanks



Source: Niang, Diop, Mbégué, Radoux, 1994

Tableau 3, Rendement épuratoire des cascades en %  
 Table 3, Purification yield of different organising tanks in %

	MES	DCO	NKe	P.Total	Coli.fécaux
Cascade 1	90	80	84	71	9,6.10 <sup>4</sup>
Cascade 2	31	-6	65	26	3.10 <sup>4</sup>
Cascade 3	66	17	68	9	3,8.10 <sup>4</sup>
Cascade 4	94	83	71	27	13.10 <sup>4</sup>
Cascade 5	84	81	68	50	5.10 <sup>4</sup>
Cascade 6	62	86	55	15	10,3.10 <sup>4</sup>
Eau brute	464	584	460	35,3	3,2.10 <sup>11</sup>

#### Légende :

- MES : Matières en suspension en mg/l
- DBO<sub>5</sub> : Demande Biologique en oxygène en mg O/l
- DCO : Demande Chimique en Oxygène
- NH<sub>4</sub><sup>+</sup> : ammonium en mg d'azote par litre
- PO<sub>4</sub><sup>3-</sup> : Phosphates en mg de phosphore par litre
- P.Total : Phosphore Total
- NKe. : Azote Kjeldahl (total)
- Coli.fécaux : Coliformes fécaux en nombre par 100 ml
- Strep.fécaux : Streptocoques en nombre par 100 ml

du fait que la rétention de l'un dans le système est parfois 7 fois supérieure à celle de l'autre (cascades 2, 3, 4, 6). Ceci ne peut être conseillé pour une eau destinée au maraîchage, à moins de procéder à des corrections.

Sur le plan de la désinfection, même si on observe un abattement des Coliformes fécaux de l'ordre de 7 puissances de 10, aucune cascade ne répond aux normes OMS de réutilisation en maraîchage sans restriction (1.000 Coli par 100 ml).

Ainsi, on note des différences de rendement entre les différents types de systèmes d'épuration extensive testés mais également au niveau des volumes d'eaux recueillis qui peuvent être très faibles pour certains systèmes (épandage sous *Eucalyptus*, marais à *Typha*, marais à *Phragmites*).

Dans une perspective de réutilisation des eaux traitées en maraîchage, l'idéal serait d'avoir:

- une bonne épuration primaire et secondaire,
- une désinfection conforme aux normes OMS,
- un abattement modéré en azote et en phosphore avec maintien d'un équilibre azote/phosphore efficace,

- une production d'eau en quantité suffisante.

Si la première condition est réalisée pour l'essentiel des cascades, on constate néanmoins un décalage entre les rétentions d'azote et de phosphore (lagunage à microphytes, prairie à *Pistia* et épandage sous sol nu). De plus, lorsque l'équilibre est atteint, le volume d'eau recueilli à la sortie du système est tellement faible au point de compromettre une éventuelle réutilisation (épandage sous *Eucalyptus*, marais à *Typha*).

Ainsi, chacun de ces systèmes d'épuration comporte des points forts et des points faibles manifestes dans le traitement des eaux usées pour une réutilisation en maraîchage. Ce qui montre que **seule une combinaison d'écosystèmes différents** permettra de moduler l'eau à la sortie en fonction de l'objectif final assigné au traitement.

#### Discussions

La disponibilité de l'eau constitue le plus grand handicap du maraîchage: 81 percent des exploitants estiment ne pas disposer d'assez d'eau pour leurs cultures. Le branchement au réseau d'eau potable de la SONEES est coûteux et ne saurait donc constituer une solution d'avenir quand la demande en eau d'alimentation humaine n'est pas satisfaite.

Il semble que pour un bon maraîchage, il faut environ 8 litres d'eau par jour et par m<sup>2</sup> pendant toute la période culturale (Delvaque, 1980), or, selon nos enquêtes, les maraîchers utilisent au moins 14 litres par m<sup>2</sup> par jour. Il y a donc là une question d'utilisation efficiente de l'eau disponible.

*Malgré tout, une des solutions pour le développement du maraîchage urbain à Dakar pourrait être la réutilisation des eaux usées, ce, d'autant plus que le volume de ces eaux augmentera proportionnellement à la croissance de la population de la ville.*

De plus, l'utilisation des eaux usées semble jouer un rôle important sur la quantité d'eau utilisée : 86 percent des exploitants s'approvisionnant en eaux usées disent utiliser moins de 14 litres par m<sup>2</sup> par jour, alors que 70 percent de ceux qui s'approvisionnent en eau de 'céane' disent en consommer entre 20 et 66 litres par m<sup>2</sup> par jour.

*L'utilisation des eaux usées réduit le nombre d'intrants employés: 76 percent des exploitants disent utiliser moins de trois types d'intrants, pendant que 87 percent de ceux qui s'approvisionnent en eau de 'céane', disent qu'ils emploient au moins trois types d'intrants.*

*Cependant, la réutilisation des eaux usées brutes présente à l'heure actuelle à Dakar un grave problème de santé publique. Les analyses parasitologiques réalisées sur des légumes susceptibles d'être consommés crus le confirment.*

Ce risque est accentué par le mode d'irrigation, car l'arrosage par aspersion augmente considérablement les risques de contamination. Or, 73 percent des exploitants employant des eaux usées irriguent leurs cultures par aspersion à l'arrosoir.

Nous pensons que *l'avenir du maraîchage se trouve dans la réutilisation des eaux résiduaires moyennant un effort de la part des pouvoirs publics, notamment dans le domaine du traitement des eaux usées par des techniques extensives techniquement et financièrement accessibles.*

Les résultats enregistrés à la Station Expérimentale de Cambérène semblent montrer que les six procédés extensives d'épuration des eaux usées testés à Dakar ne produisent pas une eau traitée satisfaisante, pour une réutilisation en maraîchage, même si par ailleurs les rendements épuratoires respectent les normes de rejets.

Les recherches doivent donc s'orienter vers une optimisation des rendements par des combinaisons judicieuses d'écosystèmes artificiels au sein d'une même chaîne épuratoire.

#### Notes

<sup>1</sup> Les résultats présentés ici proviennent d'une étude réalisée par Fall C. en 1995 sur l'impact sanitaire de l'utilisation des eaux usées brutes en maraîchage.

<sup>2</sup> Cette méthodologie a été mise au point en 1978 par M.Radoux à la station expérimentale de Viville en Belgique.

#### Références

Beniest, J. et al. (1987). Guide pratique du maraîchage au Sénégal, ISRA/Centre pour le Développement de l'Horticulture, Dakar, Coll. Cah. d'Inf. n° 1.

Chastel, J.M. (1982). Etude des Systèmes de Production dans la zone de culture maraîchère des Niayes de Lompoul. Grande côte du Sénégal. Mémoire de fin d'études Dijon, ENSSAA. Chaire des Sciences Economiques.

Delvaque, J. (1980). *Etude pour une Planification des cultures maraîchères au Sénégal. Tome 3. Production, Couverture des besoins, Prévisions régionales, Organisation et Mesures Stratégiques. Conclusions et Recommandations.* Dakar: Centre pour le Développement de l'Horticulture du Sénégal.

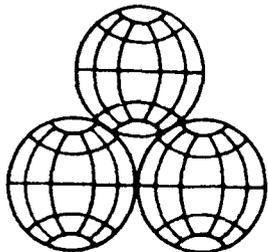
Fall, C. (1992). Communication orale, Semaine de L'IFAN du 4 au 9 mai 1992.

Kane, A. (1973). L'exploitation maraîchère et fruitière dans la région de Sangalkam, mémoire de maîtrise de Géographie, Département de Géographie, Faculté des Lettres et Sciences Humaines, Université de Dakar.

Mara, D. et Cairncross, S. (1991). *Guide pour l'utilisation sans risques des eaux résiduaires et des excréta en agriculture et aquaculture.* Genève: OMS/PNUE.

Ngningue, M. (1992). Les cultures maraîchères au Sénégal: Diagnostic en vue d'une approche raisonnée des itinéraires techniques, Dossier documentaire, mémoire de fin d'étude, Dakar, Ecole Normale Supérieure d'Enseignement Technique et Professionnel, UCAD.

Radoux, M., S. Niang, B. S. Dird and M. B. Mbéguéné (1994). *Épuration des eaux usées urbaines par voie naturelle et récupération des eaux traitées pour la production de bois de feu et l'irrigation de maraîchage: Suivi scientifique de la Station Expérimentale de Cambérène. Rapport annuel, Institut des Sciences de l'Environnement UCAD.*



# REVUE TIERS MONDE

n° 152 Tome XXXVIII Octobre - Décembre 1997

Revue trimestrielle publiée par  
l'Institut d'Etude du Développement Economique et Social  
Université de Paris I Panthéon-Sorbonne

n° 152

**Régis Chavigny** Economies en transition et économies en développement : une comparaison

**Pierre Huyette** Mobilité et informalité : des nouvelles formes aux régulations modernes de l'emploi en Colombie

**Jean-Pierre Lachaud** Exclusion du marché du travail, inégalités et genre dans les capitales africaines : une méthode nouvelle de mesure

**Laurent Parrot** Les modèles d'équilibre général calculable : un nouveau cadre d'analyse pour comprendre les conséquences des politiques macro-économiques sur la ville ou le village

**Taladidia Thiombiano** La controverse empirique et théorique posée par le comportement des producteurs-consommateurs

**Stéphane Tizio**  
**Yves-Antoine Flory** L'initiative de Bamako : santé pour tous ou maladie pour chacun ?

**Patrick Plane** La privatisation de l'électricité en Côte d'Ivoire : évaluation et interprétation des premiers résultats

**Karine Bennafla** Entre Afrique noire et monde arabe : nouvelles tendances des échanges informels tchadiens

## Documentation

**Michel Lelart** Un exemple d'intégration institutionnelle : l'évolution de la zone franc

## Débat

**Frédéric Durand** L'exportation du bois brut peut-elle aider à préserver les forêts tropicales ? Le cas de l'Indonésie et des Philippines

## Bibliographie - Analyses bibliographiques

Table des matières du tome XXXVIII, 1997

*Si vous désirez en rendre compte, un exemplaire vous sera adressé sur demande*

Rédaction et administration : Institut d'Etude du Développement Economique et Social  
58, Bd Arago 75013 Paris - tel : 01 44 08 73 07 - fax 01 47 07 81 75

Abonnements et ventes : Presses Universitaires de France - Département des Revues  
14, avenue du Bois de l'Épine B.P. 90, 91003 Evry Cedex - tel : 01 60 77 82 05 - fax 01 60 79 20 45

Prix du numéro : 145 F - Abonnements pour l'année 1997 : France 480 F - Etranger 530 F

Publié avec le concours du Centre national des Lettres



## FARMING IN THE CITY: FROM ANALYSIS TO ACTION

**Julie van der Blik and Ann Waters-Bayer**

ETC Foundation, P.O. Box 64, NL-3830 AB Leusden, The Netherlands

Address for correspondence: Rohnsweg 56, D-37085 Göttingen, Germany; Tel: +49-551-485751; Fax: +49-551-47948; Email: wb.waters@LINK-GOE.zerberus.de

### Abstract

Accepted September, 1995

*It is time for research into urban agriculture to shift from description to action orientation. This article outlines an approach which involves urban dwellers, local organisations, municipal authorities and interdisciplinary researchers in analysing the current context of urban farming, identifying problems and potentials, and planning joint action.*

### Résumé

*Les auteurs notent qu'un plus grande effort de recherche sur l'agriculture urbaine doit maintenant être consacré à informer des interventions pratiques dans des situations spécifiques. S'inspirant de l'expérience en évaluation rapide participative, dans le cadre de stratégies communautaires de développement en milieu rural, les auteurs soumettent une approche pour la recherche-action en agriculture urbaine. Cette approche offre un cadre de référence, adaptable pour chaque ville donnée, permettant, avec le concours des citoyens, organisations locales, autorités municipales et chercheurs de diverses disciplines, d'analyser en premier lieu le contexte local pour y reconnaître fonctions et ressources disponibles, d'identifier ensuite problèmes et opportunités d'intervention par diagnostic participatif, tout ceci menant à l'adoption d'interventions conjointes par les acteurs concernés, tant au niveau des unités de voisinage qu'à la ville-même.*

### Background

In recent years, numerous examples of urban farming throughout the world have been documented, analysed and discussed. However, this research has not yet led to widespread action to promote and support urban farming and to reduce potential dangers. Studies have often been limited to describing what is happening where and who the farmers are. To make a step forward, a more action-oriented approach is needed. This approach starts with a preliminary analysis of the context of agricultural activities in a particular urban centre and leads into an appraisal carried out together with current and potential farmers among the urban population. The process may be initiated by universities or local governmental or Non-Governmental Organisations (NGOs) which are interested in promoting urban agriculture or by external donor agencies that have recognised the farming initiatives of the urban poor and seek to support them.

### Analysing the Context

The initial contextual analysis is meant to provide an overview of the situation. This can be conducted by researchers and/or local government planners or the staff of NGOs, depending on who has taken the initiative and who has the capacity to carry out such an analysis. Attention needs to be paid to the following aspects:

(a) physical constraints and potential:

- land: availability, slope, drainage, alternative uses;
- water: rainfall, evapotranspiration, sources, availability and accessibility, quality; and
- soil: quality (physical and chemical composition), availability of external nutrients (e.g. ingredients for compost), pollution

(b) institutional and legal framework:

- legal status of crop cultivation, tree growing and animal

husbandry in the urban centre;

- extension services for urban farmers, and the capacity and specifically urban-related technical knowledge of these services;
  - research institutions with interest and capacity to support urban farming;
  - Community-Based Organisations (CBOS) and NGOs with interest and capacity to become involved in urban farming;
  - urban council and other government bodies relevant for promoting urban farming, and their capacity to become involved; and
  - incentives or disincentives for urban farming: subsidies, provision of allotments, rules and regulations, taxes
- (c) socioeconomic situation:
- knowledge: basis of indigenous knowledge (also of immigrants) for existing urban farming, potential sources of knowledge (ethnic background and place of origin of urban resident farmers, length of residence in and familiarity with the urban centre);
  - sources of livelihood, and relative importance of urban cultivation, tree growing and animal husbandry;
  - access to resources such as land, water, capital, labour, production inputs;
  - rural-urban linkages: sources of income, inputs (forage, manure, seed etc.), knowledge and labour, flowing in either direction;
  - nutritional status of families, and contribution of urban farming to family nutrition;
  - pattern of food availability from urban farming: seasonality and variations from year to year;
  - economic position: identification of groups under economic stress, dynamics of this stress in recent years; and

**Box 1: Participatory Planning by Poor Women in Dakar, Senegal**

This example from Dakar, Senegal, which concerns the planning of micro-enterprises in food processing, illustrates an approach that could also be taken in planning income generation from urban farming.

One of the options to improve income opportunities for poor women in Dakar is selling traditional, non-alcoholic drinks. GRAF, an NGO in Senegal which was already working with women on income-generating activities, initiated a participatory study to analyse the situation, problems and opportunities. This included three steps:

**Actor analysis**

Different actors in the production cycle (producers, vendors and consumers) were identified and interviewed. A checklist of guiding questions helped to create a picture of each group:

- \* Who are they?
- \* What are their resources?
- \* What is their working calendar?
- \* Do they work as individuals or are there collective activities?
- \* What are the advantages / reasons for choosing this activity?
- \* How and where do they produce or sell?
- \* What are the consumers' preferences?

**Reflection**

The results of the interviews were presented to the interviewees in meetings with each of the different groups of actors. During these meetings, the groups reflected on their present activities and strategies.

**Looking ahead**

During further discussions, the groups focused on the constraints they had identified and the resources available to them. Possible solutions, suggested by group members as well as by GRAF staff, were considered.

Source: van der Blik and van Veldhuizen, 1993: 19

- organisational capacity and initiatives taken by local groups with respect to urban farming.

This contextual analysis at the 'urban centre level' provides a general overview of the physical and socioeconomic situation with respect to urban farming, and of the governmental and non-governmental institutions which are involved or concerned.

**Participatory Urban Appraisal**

An appraisal is then carried out by urban dwellers, researchers from various disciplines, NGOs and possibly local government officials sympathetic to urban farming. As there can be considerable differences (socioeconomic, ethnic and topographical among others) between different sections of an urban centre, this appraisal should be done at the neighbourhood or quarter level. Not only current but also potential farmers should be involved, particularly poorer people who are keen to farm in the urban centre but cannot because of lack of access to the required resources. The participatory appraisal focuses on the advantages and disadvantages of urban farming, problems, current opportunities and observed trends which may point to potentials, other local actors in farming itself as well as in 'upstream' (input supply) and 'downstream' (processing, handling and marketing) activities, existing knowledge, gaps in skills and techniques, motivations and cultural perspectives.

Participatory Rural Appraisal (PRA) tools are becoming increasingly popular in analysing rural situations and planning action by numerous NGOs and more recently also by government institutions (*RRA Notes*, recently renamed *PLA Notes*, issued by the International Institute for Environment and Development, 3 Endsleigh Street, London WC1H 0DD, UK). There are now several examples of the application of these tools also in urban settings (Mitlin and Thompson,

**Box 2: Using Bioresource Flow Diagrams to Monitor Change**

Bioresource flow diagrams depict flows of nutrients and other inputs into a production unit and between different components of a unit. They can also be used to depict flows of nutrients (e.g. food and fertiliser purchases, consumption and sales of nutrients in foods and by-products, waste removal or recycling) within a city neighbourhood. This is a useful tool for stimulating a process of planning, experimentation, monitoring and improvement in resource use.

Assisted by researchers from ICLARM (International Centre for Living Aquatic Resources Management), farmers in Malawi made a joint inventory and analysis of local resources by drawing resource flows into, out of and within their farms. The farmers then discussed and sought (e.g. through visits to research stations and other farmers) alternative ways of using the available resources, and commenced their own experiments in integrated fish farming.

By comparing a series of their diagrams of bioresource flows over time, the farmers could monitor the transformation of their farming systems. The amount of material, the frequency of flow and its monetary value were recorded. Quantities were expressed in local terms. This procedure enabled both the farmers and the researchers to monitor progress and change, and also provided farmers with a tool for improving their decision making and skills in resource management.

Source: Lightfoot and Noble, 1993: 11-34

1994). Particularly such PRA tools as Venn (institutional) diagrams, social mapping, livelihood analysis, resource flow diagrams (see Box 2), services and opportunity maps, various calendars, ranking and focus group discussions can stimulate analysis with wide participation. In urban settings, games and jointly-constructed models have also proved to be effective in stimulating residents to consider together what can and should be done (Gibson, 1994: 41-47).

### Recognising Functions and Resources

Urban farming performs several functions in urban dwellers' livelihoods and in their environment. The participatory urban appraisal should help in recognising and prioritising these functions according to the criteria of urban dwellers as well as municipal authorities. This will provide a basis for designing site-specific activities to improve urban farming. These functions may include the following: nutritional: providing more balanced nutrition and thus improved health; economic: production and income generation through selling products or increasing available income through saving on food expenditures; environmental: improved city ecology, through better water drainage, creation of favourable microclimate, waste recycling and reduction in dust, among others, and aesthetic/leisure: especially in the richer cities, the aspects of gardens, parks, more green areas and garden allotments for residents without housegardens may be raised.

The relative importance of these and possibly also other functions will depend on a number of variables such as the economic and social situation of the urban family or community, the availability and location of land (e.g. in the backyard or further from the house), the preferred production sectors (horticulture, crop husbandry, animal husbandry, aquaculture) as well as the priorities of the local authorities. The relative importance of these functions will also differ between quarters within one and the same urban centre.

Besides the knowledge and labour energy of the urban dwellers, the main urban resources used for agriculture are water, nutrients (primarily from waste) and land. In many

situations, there will be a shortage of one or more of these resources. These relative shortages will likewise differ between urban quarters.

It is, therefore, important to identify clearly the limitations within which each neighbourhood operates and how these can be overcome. The (potential) farmers must be involved in making a realistic assessment of the possibilities. Creative solutions will be needed to deal with these shortages, and it is often the enterprising people already practising urban farming who can show the way.

### Stakeholder Workshops

The results of the contextual analysis at the urban centre level and the participatory appraisals in the various neighbourhoods are brought together and discussed at one or more stakeholder workshops. Here, actions to be taken at the urban centre and neighbourhood level are jointly identified in the realms of:

- policy development: creating a policy environment which enables urban farming to flourish and ensures that poorer urban dwellers have fair access to the required resources;
- research and development in both 'hard' (production) and 'soft' (organisational) technologies: close collaboration with the farmers themselves in identifying, testing and adapting not only production technology options for urban farming but also organisational options such as the allocation of temporary resource-use rights for specific purposes, e.g. unbuilt land for cultivation, or roadside trees for harvest (also for animal feed); and

#### Box 3: Framework for Analysis and Action

##### GENERAL ANALYSIS OF:

- physical constraints & potential
- institutional & legal framework
- socioeconomic situation
- functions and resources

##### STAKEHOLDER WORKSHOP(S) TO DESIGN ACTION FOR:

- policy development
- institutional development
- research & technology development
- immediate activities

##### CONTEXTUAL ANALYSIS:

analysis at 'city level', focus on general overview of physical and social situation in the city related to urban farming, governmental and non-governmental institutions involved

##### PARTICIPATORY APPRAISAL:

diagnosis with farmers and potential farmers in (selected) neighbourhoods, (dis)advantages of urban farming, problems, opportunities, changes taking place, who does what and why, traditional knowledge, gaps in knowledge and techniques, cultural perspectives

##### ACTION AT 'CITY LEVEL':

creating an enabling environment through improved planning capacity, removal of constraints, facilitating policies

##### ACTION AT NEIGHBOURHOOD LEVEL:

- participatory appraisal of problems and opportunities
- collaboration in developing technological solutions
- organisational development

Source: Compiled by the authors

(c) institutional development: supporting the development or strengthening of neighbourhood-level institutions which can interact with higher levels of organisation in promoting and implementing urban farming.

All actors concerned must be represented when a programme for action in urban agricultural development is designed. The needs and responsibilities of the city government must be confronted with the needs and responsibilities of the urban dwellers, and agreements have to be negotiated.

Stakeholder workshops provide a good opportunity for negotiations on an equal footing and for the formation of coalitions, particularly in the following types of activities:

- (a) lobbying aimed at improved urban planning and imaginative development of government policies which favour the opportunities, remove the constraints and minimise the problems which are faced and created by urban farmers; and
- (b) participatory action research, involving farmers, scientists, extensionists, artisans and other input suppliers, in order to develop appropriate technologies for the specific conditions of farming in that city or neighbourhood (Reijntjes et al., 1992; van der Blik and van Veldhuizen 1993 and van Veldhuizen and de Zeeuw, 1992).

#### Participatory Monitoring

It is important that support be given to immediate implementation of the activities identified during the process of contextual analysis and participatory appraisal and planning. Initially, it may be possible to support action only in selected neighbourhoods. This needs to be accompanied by participatory monitoring and evaluation of the activities. Only in this way can lessons be learned for improving and expanding the programme of urban agricultural development.

It will not be sufficient to establish a programme for urban agricultural development based on only one round of analysis and planning. Some institution must be created which permits continuation of a process: monitoring changes and impacts, and redesigning the programme accordingly. This institution, which could take the form of a 'city farming committee'

involving representatives of stakeholders at all levels, would also provide a platform for re-negotiation of rights and responsibilities. This will be necessary as the face of the urban centre and thus, of urban farming changes over time.

#### References

- Alders, C. et al. (1994). "Farming at Close Quarters". Special issue of *ILEIA Newsletter*, Volume 10 No. 4.
- Gibson, T. (1994). "Showing What You Mean (Not Just Talking About It)", *RRA Notes* Vol. 21.
- Leitmann, J. (1994). *Rapid Urban Environmental Assessment: Lessons from Cities in the Developing World*. Washington, DC: World Bank Urban Management Programme.
- Lightfoot, C. and R. Noble (1993). "A Participatory Experiment in Sustainable Agriculture", *Journal of Farming Systems Research-Extension* Vol. 4 No. 1.
- Mitlin, D. and J. Thompson (1994). "Special Issue on Participatory Tools and Methods". London: IIED Sustainable Agriculture Programme & Human Settlements Programme, *PRA Notes* No. 21.
- Reijntjes, C. et al. (1992). *Farming for the Future: An Introduction to Low-External-Input and Sustainable Agriculture*. London: Macmillan.
- van der Blik, J. and L. van Veldhuizen (1993). *Developing Tools Together: Report of a Study on the Role of Participation in the Development of Tools, Equipment and Techniques in Appropriate Technology Programmes*. Leusden: ETC Foundation.
- van Veldhuizen, L. and H. de Zeeuw (1992). *Learning for Participatory Technology Development: A Training Guide*. Leusden: ETC.

# The PAKISTAN DEVELOPMENT REVIEW

ISSN 0030-9729

*An International Journal of Development Economics*

**Editor**  
SARFRAZ KHAN QURESHI

**Literary Editor**  
AURANGZEB A. HASHMI

**Book Review Editor**  
MIR ANNICE MAHMOOD

**Co-editors**  
M. GHAFAR CHAUDHRY  
MOHAMMAD IRFAN  
SHAHNAZ NAZI  
ASHFAQUE H. KHAN  
SHAMIM A. SAHIBZADA

**Editorial Board**  
RASHID AMJAD  
PER PINSTRUP ANDERSEN  
ROBERT E. BALDWIN  
PRANAB BARDHAN  
FREDRIK BARTH  
JERE R. BEHRMAN  
J. C. CALDWELL  
ANSLEY J. COALE  
S. I. COHEN  
P. A. CORNELISSE  
ANGUS S. DEATON  
E. V. K. FITZGERALD  
MAURICE GODELIER  
NADEEM UL HAQUE  
M. AYNUL HASAN  
S. HIRASHIMA  
NURUL ISLAM  
A. R. KHAN  
M. ALI KHAN  
MAHMOOD H. KHAN  
MOHSIN S. KHAN  
KAROL J. KROTKI  
DAVID P. LAIDLER  
ROBERTO S. MARIANO  
JOHN W. MELLOR  
GUSTAV F. PAPANEK  
SAMUEL H. PRESTON  
GERRY RODGERS  
VERNON W. RUTTAN  
ANWAR SHAH  
ISMAIL SIRAGELDIN  
T. N. SRINIVASAN  
WILLIAM C. THIESENHUSEN  
PAN A. YOTOPOULOS

**The Impact of Socio-economic Factors on Fertility Behaviour: A Cross-country Analysis**  
Rehana Siddiqui 107

**Government Interventions, Market Integration, and Price Risk in Pakistan's Punjab**  
Takashi Kurosaki 129

**Husband-wife Roles as a Correlate of Contraceptive and Fertility Behaviour**  
Muhammad Iqbal Zafar 145

**Determinants of Rural Poverty in Pakistan: A Micro Study**  
Shahnawaz Malik 171

## BOOK REVIEWS

**Overseas Development Administration. A Guide to Social Analysis for Projects in Developing Countries**  
Mir Annice Mahmood 189

**Bina Agarwal. A Field of One's Own: Gender and Land Rights in South Asia**  
Yasmeen Mohiuddin 191

**Loes Schenk-Sandbergen (ed). Women and Seasonal Labour Migration**  
Rehana Siddiqui 197

**SHORTER NOTICES** 200

Volume 35

Summer 1996

Number 2

Annual Subscription U.S. \$ 100.00, Pak Rs 300.00 by surface mail and U.S. \$ 125.00, Pak Rs 400.00 by air mail. Per issue U.S. \$ 30.00, Pak Rs 75.00 by surface mail and U.S. \$ 35.00, Pak Rs 100.00 by air mail for 1997 only. Subscriptions are entered on a calendar year basis. Payment should be made directly through a demand draft, issued in the name of the **Pakistan Institute of Development Economics**, Post Box 1091, Islamabad-44000 (Pakistan)

## FARMING IN THE CITY OF KAMPALA: ISSUES FOR URBAN MANAGEMENT

Gertrude Atukunda and Daniel Maxwell, respectively

Makerere Institute of Social Research, Makerere University, P.O. Box 16022, Kampala, Uganda; and  
Land Tenure Center, University of Wisconsin, 1357 University Avenue, Madison, WI 53715 USA

### Abstract

Accepted September, 1995

*In Kampala, Uganda as in many other African urban centres, lower real wages and fewer formal employment opportunities have led to increased reliance on subsistence income, much of it from urban agriculture. Despite being a pervasive activity, urban agriculture is technically illegal in Kampala, and is further constrained by a normative bias on the part of urban authorities. This paper provides a detailed description of urban farming in Kampala and presents comparative data on urban households that do and do not engage in urban farming. The paper then discusses constraints on urban farming, highlighting particularly the issue of municipal bylaws and policies. Methods of promoting a dialogue among urban farmers, researchers and urban policy makers are presented and potential solutions to policy problems are discussed.*

### Résumé

*Dans la ville de Kampala comme ailleurs en Afrique, le fléchissement des niveaux salariaux et la contraction des débouchés sur le marché formel de l'emploi, au cours des récentes décennies, ont poussé bon nombre de gens à dépendre de revenus de subsistance. Une bonne part de ces revenus est assurée par l'agriculture urbaine. Bien qu'elle soit une activité fort répandue, l'agriculture urbaine reste le plus souvent techniquement illégale la ville de Kampala, contrainte de surcroît par une normatisation défavorable. Cet article présente une description détaillée de l'activité agricole à Kampala et dresse une analyse comparée de données recueillies auprès de ménages urbains qui pratiquent l'agriculture urbaine et d'autres qui ne la pratiquent point. Conclu cet état des lieux, l'article discute les obstacles auxquels fait face l'agriculture urbaine à Kampala, particulièrement en ce qui a trait aux politiques et règlements municipaux. Les auteurs proposent des façons de promouvoir un meilleur dialogue entre producteurs, chercheurs et décideurs urbains, ainsi que de possibles avenues de solution aux obstacles politiques courants et probables.*

### Prologue

On a dry-season afternoon in Kampala in June, 1993, an elderly gentleman was weeding a small plot of maize and beans that he was growing in a vacant lot downtown where a building had been bombed during the 1979 war against the regime of Idi Amin. In a few weeks, the crops would mature, and he planned to harvest them to use for home consumption. In the mid-afternoon, a group of uniformed law enforcement officers from Kampala City Council (KCC) appeared and without warning or notice, slashed down his small garden. This act so enraged passers-by that they immediately began shouting at the KCC workers and attacked them with stones. A passing journalist wondered what the fighting was about and inquired, first from passers-by and later from the KCC official who had sent the law enforcement officers into the field. To the passers-by, the issue was simple: the old man was minding his own business, growing food for his own consumption using land that was otherwise going to waste and growing up in elephant grass, which KCC was not bothering to keep slashed anyway. He was being needlessly harassed by KCC law enforcement officers who, therefore, deserved verbal abuse and stoning. The KCC official, on the other hand, stated that he was merely carrying out his prescribed duties under the Urban Authorities Act, and added,

"I am ready to cut down all the beans, maize and cassava within the perimeters of [Kampala] even if it means life or death." (Filliam, 1993:4)

This brief incident captures several critical aspects of the story of farming in the urban centre in contemporary Africa. In this case, the farmer was an elderly man; more typically it would have been a woman with children. But in either case, the individual involved was poor and relied on informal access to otherwise unused land to grow some food for home consumption. While clearly considered a socially legitimate activity by the general public, farming is technically illegal in many African urban centres. Kampala's urban farmers are not subjected to this kind of official harassment every day, but the economic activities and land-use practices in which they engage fall into a category in which social legitimacy and legal status are at least somewhat at odds with each other. And of course, the official quoted was being overly dramatic: To him, urban agriculture is not a matter of life and death. However, to the thousands of Kampala residents who farm in the city, it is certainly a matter of quality of life, if not life and death. And to the city as a whole, which is emerging from a two-decade era of economic crisis, coming to grips with informal economic practices falling in a gray area where legitimacy and legality are not synonymous, urban farming

---

*Acknowledgements*—We would like to express our thanks to Makerere Institute of Social Research for institutional support during field work, and to the US Department of Education (Fulbright-Hays Program) and the US National Science Foundation (Sociology Program) for funding support for this research. We would also like to thank the International Development Research Centre and Luc Mougeot in particular, for funding support for the seminar/workshop at the conclusion of the study, which is described in the paper.

---

is symptomatic of other contentious issues in contemporary urban management in Africa.

While farming has long been an urban activity in African urban centres (Southall and Gutkind, 1957), 'urban agriculture' remains at best an oxymoronic concept to urban planners and administrators and, sometimes, as this story depicts, an embarrassment to be stamped out—a "remnant of bush life" in the words of novelist Naipaul (1981). This paper will present an overview of urban farming in Kampala, Uganda and relate empirical evidence from Kampala to the broader literature on urban agriculture in Africa in order to draw out relevant issues for urban management and policy; make specific recommendations for policy makers and urban planners and highlight methods of addressing the urgent need for dialogue among farmers, researchers and urban policy makers about urban farming and related practices.

### Urban Farming and Urban Management: Some Salient Concerns

Structural Adjustment Programmes (SAPs) have now been implemented across Africa, with varying levels of success. However, even where these programmes have the intended effect on overall economic growth, the sectoral impact in the short to medium term on the urban wage earning class and the poor have been well documented, both in Kampala and elsewhere: Austerity measures have cut the social programmes (Loxley, 1989) and have also cut civil service wages (Chew, 1990:1003–1114) and led to major cutbacks in civil service employment; economic liberalisation has led to the failure of some domestic industries (Mamdani, 1990: 427–467) and the steep increase in the price of food (Cornia, Jolly and Stewart, 1987 and World Bank, 1993). Feeding the urban centres remains one of the salient policy questions at the root of various agricultural marketing reforms throughout the era of the SAP (World Bank, 1989 and Guyer, 1987).

Donor agencies, research organisations and governments that are concerned about the potential food security risks in the short and medium term to vulnerable groups in the context of the general decline of urban formal economies and the process of economic restructuring, have recently become aware of the potential of urban food production to address some of these risks (World Commission on Environment and Development, 1987; Cornia, Jolly and Stewart, 1987; Atkinson, 1992; von Braun et al., 1993 and Bart, 1994). The conventional argument is that SAP is designed to make rural farming a more economically attractive livelihood, which will solve the urban food problem through increased incentives for rural production. However, in the short to medium term, the burden on low and middle income urban households is increased. This has resulted in a rapid expansion in the practice of urban agriculture and interest on the part of donor agencies and researchers and to some extent, national governments.<sup>1</sup>

Only fairly recently has urban farming in Africa been the subject of serious research (Sanyal, 1985:15–24; Lee-Smith et al., 1987; Rakodi, 1988:495–575; Mvena et al., 1991; Freeman, 1991; Maxwell and Zziwa, 1992 and Sawio, 1993). Many of these studies have not been incorporated into

mainstream research on urban management in Africa. Recent reviews of African urbanisation (Coquery-Vidrovitch, 1991: 1–98), urban employment (International Labour Organisation, 1989) and urban planning (Mabogunje, 1990:121–203) do not mention the topic at all. A major review of the urban food security problem in Africa mentions urban agriculture tangentially (Guyer, 1987).

The definition of 'urban agriculture' is somewhat amorphous. Most empirical literature on Africa defines it simply as farming within the boundaries of the municipal area. In many countries in eastern and southern Africa, farming is technically illegal in urban centres. Nevertheless, farming is widely if uneasily tolerated in most urban centres, in part because at least some officials recognise informally that urban farming is an important component of urban food sources and in part because of the sheer impossibility of the enforcement of bylaws. Most of the research that has been carried out portrays urban agriculture as a household survival strategy,<sup>2</sup> one of the many ways in which urban families have redeployed their labour and other resources in the struggle to survive in an increasingly hostile environment.

Fairly common biases on the part of urban managers toward urban agriculture are reported in these studies. First, it is almost universally perceived as an activity of the urban poor that is of only marginal economic significance (Sanyal, 1985:15–24 and Maxwell and Zziwa, 1992). Because it is a second or third form of employment or economic activity, census figures underestimate, often by large margins, the number of people or households engaged in urban farming (Uganda, 1992b). Household income surveys contribute to the perception by enumerating only cash income, which is often quite minimal compared to the value of subsistence consumption. Second, urban agriculture is widely perceived to be a public health hazard in terms of providing a habitat for various disease vectors, both insects and rodents (Sanyal, 1985:15–24; Freeman, 1991 and Maxwell and Zziwa, 1992). Some authorities also believe that urban agriculture is a threat to security by providing ready hiding places for thieves in densely populated areas. Third, agriculture is perceived by urban authorities to be an activity that simply does not belong in the urban centre. Farming is viewed as 'backward', and its presence in the urban centre reflects negatively on the standard of urban development. Complaints about the contemporary 'ruralization' of urban centres are frequent (Bibangambah, 1992 and Mlozi, Lupanga and Mvena, 1992) and it is widely believed that it is only the most recently-arrived migrants from rural areas who practice farming in the urban centre (Sanyal, 1985:15–24; Maxwell and Zziwa, 1992).

Accordingly, most studies set about to disprove some of these notions. The first one is reasonably simple to argue: most studies show that it is not only the urban poor who farm in the urban centre. Sawio (1993) in particular showed evidence that all socioeconomic groups in Dar es Salaam are engaged in farming and that, in fact, the urban poor may be getting squeezed out of urban agricultural production by middle and upper class urban residents who can gain access to land more readily. Sanyal (1985:15–24), Freeman (1991), and Maxwell and Zziwa (1992) showed clearly that urban

farmers are primarily not the most recently-arrived migrants, that in fact it takes some time for a migrant to get settled in the urban centre before being able to gain access to land for cultivation.

The second bias is less easily challenged because it is not an agricultural or social question, but rather regards public health. The public health implications of free-roaming livestock are self-evident, but in fact, much of proclaimed health danger from urban farming regards cultivated crops. Sanyal (1986) noted municipal ordinances banning plants that may harbour mosquitoes—singling out maize in particular. But he also cites a study in which a team of Zambian scientists showed that mosquitoes do not breed in maize. A similar study in Kampala showed numerous other urban habitats to be the primary sources of mosquito-borne disease (Wayira et al., 1992). Because agronomic crops are singled out for regulation but ornamental plants are not, many researchers dismiss this issue as simply being a manifestation of the third bias. Only rarely, however, has research provided urban managers with hard evidence that urban farming may contribute positively to public health, specifically in terms of improved food security and nutritional status.

The third bias is most difficult to counter since it is purely one of definition and normative views. Perhaps as a result of researching a topic against which such strong normative biases are held, many researchers of urban agriculture have tended to become advocates of the practice. For example, Freeman (1991:121) characterised urban farmers in Nairobi as “vigorous, energetic and determined. Their plots of cropland are gardens of hope, not wastelands of despair”. Sanyal (1985:14–24) characterised urban farming as an “innovative response” to the problems that confronted urban dwellers in the 1980s; Mvena et al. (1991) noted that urban farming in Tanzania is a “normal way of life”. Dettweiler (1985) described the urban farms of Senoufo migrants in Bamako as constituting an “unqualified success”. Much of this advocacy revolves around employment and the provision of a non-market source of food, particularly for the urban poor.

Almost without exception, the conclusions of these studies reflect the original conclusion of Sanyal (1985:19) that in Lusaka “urban agriculture is predominantly a coping strategy adopted by households whose monetary incomes are insufficient for purchasing adequate amounts of food.” Sanyal’s study preceded recent research on individual strategies and the difference between ‘coping’ and ‘adapting’. Streifeller (1987: 8–13) specifically emphasised the need to have a food source that avoids middlemen. Memon and Lee-Smith (1993:25–42 especially p. 38) underline the point that “subsistence production is a common but poorly documented strategy adopted by the urban poor to feed themselves.” However, at least one recent study claims that it is not primarily the urban poor who benefit from urban agriculture (Mbiba, 1995).

The strong differences in normative views toward urban agriculture between researchers who have investigated the practice and urban managers responsible for policies toward the practice suggest an urgent need for dialogue. The

concluding section of this paper suggests some means of addressing this need.

### **Overview of Urban Farming in Kampala, Uganda**

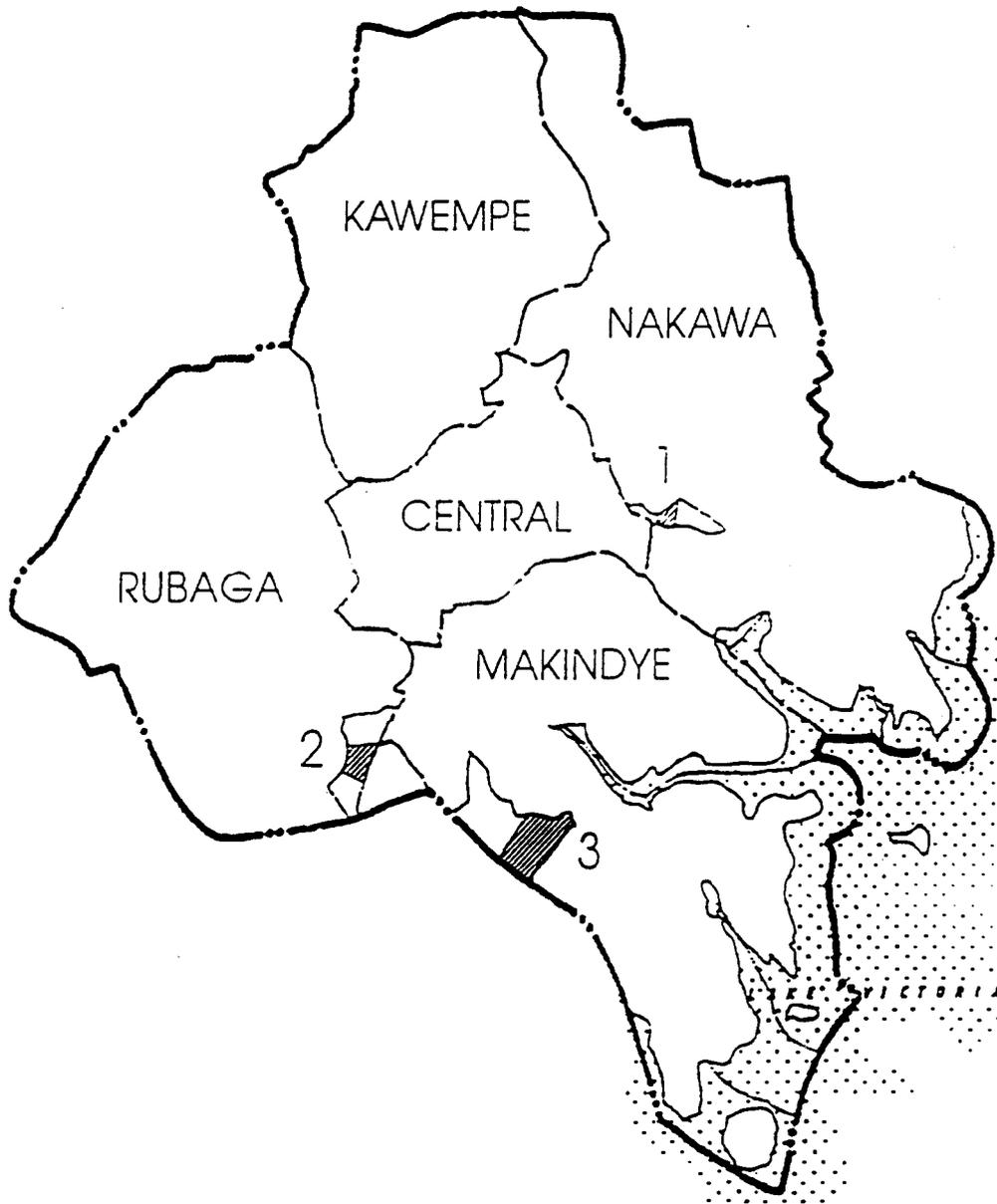
The following discussion draws primarily on research carried out by the authors in Kampala from December, 1992 to October, 1993, building on a preliminary study in 1988–1989 (Maxwell and Zziwa, 1992). The study consisted of a series of 44 comparative household case studies, a two-round survey of 360 households in three areas of the city selected through a multi-stage sampling procedure and interviews with municipal authorities and political leaders. Focus groups and key informant interviews were used to supplement these three sources of primary data. The survey enumeration areas of the city are depicted in figure 1. To present a brief overview of urban farming, three points will be discussed below. These include the origins of farming in Kampala, the extent of farming in the city and a comparison of farming and non-farming households in terms of general demographic characteristics, labour allocation and nutritional status.

#### **(a) The Origins of Farming**

Urban farming and the use of urban land for agricultural purposes has long been a common practice in Kampala (Southall and Gutkind, 1957). The crisis of institutional breakdown, economic mismanagement and civil conflict that characterised the social life of Uganda from the onset of the Amin regime until the mid to late 1980s created particularly difficult circumstances for Kampala residents (Ochieng, 1991 and Obbo, 1991). The political consequences of the Amin regime are well known, but economically, the major impact was the precipitous decline in real wages paid to the urban labouring class (Banugire, 1985: 52–66; Jamal, 1987 and Jamal and Weeks, 1993).

The responses at the household level to this massive decline in real income from wages have been characterised in various ways, but in general can be described as the diversification of income sources and the informalisation of work (Bigsten and Kayizzi-Mugerwa, 1992: 1423–1441; Jamal and Weeks, 1987 and 1993: 271–291; Jamal, 1988: 679–701; Banugire, 1985: 52–66 and Obbo, 1991). However, this general trend has taken many forms. The first of these is the dramatically increased participation of urban women in income-generating activities (Obbo, 1991; Basirika, 1992 and Manyire, 1993). Much of this activity has been in the form of small-scale, informal trading and in the preparation and sale of food. The second, partly overlapping with the first, is vastly increased proportions of the population engaged in small-scale manufacturing, informal trade or informal delivery of services, given the extent to which municipal infrastructure had broken down. Much of this activity constituted a second or third source of income at the household or even individual level. A third category of responses was linked largely to the high cost of food in the city. These included making changes in the basic diet of the urban population, mostly substituting cassava or grains for more expensive plantains (Jamal, 1987) and strengthening linkages with rural kin, trading services for food (Jamal and

Figure 1, Administrative divisions of Kampala, Uganda



1. Kiswa Parish

2. Najjanankumbi Parish

3. Luwafu Parish

(Enumeration areas highlighted)

Weeks, 1987: 271–291; and Obbo, 1991). And, of course, also related to the high cost of food in the city, urban residents and, in particular, urban women increasingly used small parcels of land in the city for agricultural production. While farming has always been a minor factor in Kampala's economy, during the past two decades it has become much more prevalent even in the most densely populated parts of the city.

In 1968 Kampala was enlarged and this territorial expansion brought into the city peri-urban areas in which both population density and land-use practices were no different from the surrounding rural areas. Hence, for the past 20 years, there have been two different forms of agriculture in the city—increased use of vacant land within the city's centre for farming on a small scale, and continued farming of land within the expanded boundaries of the city. Both have been subject to the same set of municipal rules that ban farming in the city. Nevertheless, the extent of urban agriculture in the city has meant that, municipal bylaws notwithstanding, the practice has largely been tolerated even while remaining subject to occasional crackdowns.

Data from the case studies and survey show three different time periods when large numbers of people began farming in the city. The first of these groups has always been engaged in farming, and the areas where they live have been incorporated into the city. A second group began farming in the mid-1970s, around the time that city residents began facing severe economic problems in the wake of the Amin regime's 'economic war'. A third group began in the late 1980s. While this time period corresponds with the beginning of the policy impacts of SAPs, it also corresponds with dramatically improved security in the city, making possible economic activities that were too risky to carry out prior to 1986. Evidence from the household case studies supports both the impact of structural adjustment and improved security as reasons why more people began farming in the late 1980s.

### (b) The Extent of Urban Agriculture

Kampala is comprised of 213 square kilometres (21,300 hectares). The most recent estimate for the city puts agricultural land-use at a total of 11,942 hectares, or 56.1 percent of the total land area of the city (Uganda, 1992a). This figure includes some areas which, while within the municipal boundaries, cannot really be described as 'urban', with population densities as low as six people per hectare. Nevertheless, all the area within the municipal boundaries is subject to the same urban bylaws, which technically do not permit the use of land for agricultural purposes. Survey data in table 1 show an estimated 34.8 percent of Kampala households are engaged in some form of agriculture within the city. Using 34.8 percent as the estimator for the proportion of households engaged in farming within the city, urban agriculture directly affects the livelihood and/or diet of roughly half the residents of Kampala.<sup>3</sup>

### (c) Who Farms and Why? A Comparison of Farming and Non-Farming Households

There is a relatively small number of commercial farmers within the city producing primarily for sale to the urban

market. The vast majority of farmers are producing primarily for home-consumption, though they may sell varying amounts of their produce depending on the need for cash, alternative sources of income, and intra-household distribution of income. With the exception of the small, commercially oriented group, urban agriculture in Kampala represents the phenomenon referred to by Mingione (1991) as semi-proletarianisation: reliance on either wage labour or petty trading (or both), as well as on home-production for consumption.

The vast majority of labour in urban farming in Kampala is that of women. Survey data show roughly the same proportions of engagement in urban farming across all income groups, ethnic groups, ages and across differing levels of education among both men and women (table 2). Thus,

Table 1, Extent of Farming in Kampala, Uganda

Enumeration area	Proportion of households farming		Area of land farmed		
	N	%	Median	Mean	SD
Luwafu <sup>a</sup>	64	54.7	820	1,204	1,040
Kiswa <sup>b</sup>	33	28.7	125	206	269
Najjanankumbi <sup>c</sup>	24	20.7	260	416	416
<b>TOTAL</b>	<b>121</b>	<b>34.8</b>	<b>380</b>	<b>776</b>	<b>913</b>

<sup>a</sup>A rapidly growing low to middle-income peri-urban area; population density less than 30 people/ha in the enumeration area

<sup>b</sup>A low-income, densely populated inner city slum; population density around 190 people/ha in the enumeration area

<sup>c</sup>An older, mixed-income residential suburb; population density around 70 people/ha in the enumeration area

Source: Authors' survey, 1993

farming is an activity largely carried out by women, but it cuts across most other social groupings in the city. The only group that is significantly less involved are people who have only recently arrived in the city, who have not been able to acquire any land for farming.

The most commonly cited immediate reason given for farming is the need to provide a source of food for the household. Income is somewhat more common as the major motive for livestock-keeping. However, there are three main reasons why people do not engage in farming. First and most obvious was the issue of access to land: A number of case study respondents noted that they had previously farmed in Kampala but had lost access to their land. The majority were simply unable to acquire land at all, and so had never been able to farm in the city. The second category of constraint revolved around the issue of time, including the large amount of time it may take to locate land for farming. For well-off respondents, the issue of time is related to opportunities for earning alternative sources of 'moonlighting' income. A third and relatively minor category simply has no desire to farm in the city or to produce food.

### (d) Statistical Comparison of Farming and Non-Farming Households

Table 2 compares farming and non-farming households in the present sample for a number of variables. Several

**Table 2, Characteristics of Households: Total Number of Farming and Non-Farming in Kampala, Uganda**

Variable	Total		Farming		Non-farming	
	N	% <sup>a</sup>	N	% <sup>b</sup>	N	% <sup>b</sup>
Total Sample	348	100.0	121	34.8	227	65.2
Female Household Head	94	27.0	34	36.2	60	63.8
Male Household Head	254	73.0	87	34.3	167	65.7
Very Low Income	55	15.8	20	36.4	35	65.6
Low Income	219	62.9	71	32.4	148	67.6
Lower Middle Income	53	15.2	22	41.5	31	58.5
Upper Middle/ High Income	21	6.1	8	38.1	13	61.9
Farm Outside Kampala	86	24.7	26	30.2	60	69.8
Permanent in Kampala	219	62.9	92	42.0	127	58.0

<sup>a</sup>Proportion of total<sup>b</sup>Proportion of category

Source: Authors' survey, 1993

important facts are brought out by these data. First, there is scarcely any difference between farming and non-farming households in many of socioeconomic categories. Just over one-third of the households (34.8 percent) in the sample had someone engaged in urban agriculture. This proportion remains relatively constant if analysed separately in terms of many other variables depicted: all income groups, intended permanence of residence in the city, even sex of head of household (table 2).

The only variables that differ significantly between farming and non-farming groups are household size, number of children, age of both male and female adults and length of residence in Kampala (table 3). Farming respondents reported being in the city an average of 7.2 years longer than non-farming respondents. On average, a farming respondent had lived in Kampala for 9.5 years before beginning to farm, although the answers were quite variable. These data indicate a lack of any strong relationship between urban agriculture and income level, formal employment, or levels of formal education. But they do suggest that farming households are likely to be larger, include more children and have significantly older adults. They are also likely to have been resident in Kampala longer.

#### (e) Allocation of Women's Labour

A small group of respondents listed lack of time as a major constraint to farming; all but one were involved in either wage labour or trading away from their households for a major period of time every day. Table 4 compares the demands on women's time in farming and non-farming households during the first round of the survey. These data bring out several points. One is that farming is an activity in addition to, not instead of, other activities both within the household and outside of it. Farming women devote somewhat less time to outside economic activities such as wage labour or trade, but devote the same amount of time to other household chores

**Table 3, Mean Characteristics of Households: Farming and Non-Farming in Kampala, Uganda**

Variable	Total		Farming		Non-farming		Diff	T-test p-value
	Mean	SD	Mean	SD	Mean	SD		
Household Size	4.9	3.1	6.3	3.1	4.2	2.8	2.1	<0.01
Number Employed	1.4	0.7	1.4	0.8	1.3	0.6	0.1	NS
Children < 5 Years	1.0	1.0	1.3	0.9	0.9	1.0	0.4	<0.01
Education of Man	10.1	3.9	9.0	4.8	9.5	4.0	0.5	NS
Education of Woman	7.6	4.2	7.8	4.3	7.9	4.1	0.1	NS
Age of Man	34.1	10.1	37.2	11.8	32.1	8.7	4.8	<0.01
Age of Woman	31.1	11.8	34.4	13.3	29.1	10.3	5.3	<0.01
Length of Residence in Kampala	15.5	13.5	20.2	15.2	12.9	11.6	7.2	<0.01

Source: Authors' survey, 1993

**Table 4, Demands on Women's Time: Farming and Non-Farming Households<sup>a</sup>**

Activity	Farming		Non-farming		Diff	T-test p-value
	Mean	SD	Mean	SD		
Wage Labour and/ or Trading	2.7	3.8	4.5	4.0	1.8	<0.01
House Work <sup>b</sup>	4.5	2.4	4.4	2.5	0.1	NS
Child Care	5.2	4.3	3.2	3.7	2.0	<0.01
Farming	2.0	1.7	-	-	-	-
Personal Time <sup>c</sup>	1.2	2.5	1.7	3.1	0.5	0.02
Total Time	15.5	3.9	13.9	4.0	1.6	<0.01

<sup>a</sup>Data for round one of survey, April, 1993<sup>b</sup>House work is combined totals of cooking, cleaning, fetching water, and buying needed household items<sup>c</sup>Personal time is combined totals of leisure time, time devoted to volunteer activities, and a residual category that most frequently referred to time spent in formal education

Source: Authors' survey, 1993

and have less free time. Perhaps the most salient point is that farming permits mothers greater time to devote to direct care of their children than do other economic activities. These data are from round one of the survey, carried out during the rainy season. Data from round two were similar, though differences tended to become smaller in amounts of time devoted to wage labour and trade, as well as to direct child care.

#### (f) Nutritional Status of Pre-School Children

Table 5 presents data comparing nutritional status of children under the age of five years in farming and non-farming households in different income groups. The measure used is height for age expressed as Z-scores, or standard

**Table 5, Height for Age by Income Group and Farming**  
(Round I: Unadjusted HAZ, confirmed birth dates only, N=293)

Income group <sup>a</sup>	Farming		Non-farming		N	Diff	T-test p-value	Group means
	N	HAZ <sup>b</sup>	N	HAZ <sup>b</sup>				
VL	29	-0.561	26	-1.918	55	1.357	0.001	-1.203
L	71	-0.468	100	-0.900	171	0.432	0.010	-0.721
LM	21	-0.161	23	-0.727	44	0.565	0.079	-0.457
UM/H	7	0.549	16	0.962	23	-0.413	0.548	0.836
Group Means	128	-0.383	165	-0.856	293	0.473	0.002	-0.650
ANOVA	F = 1.980		F = 20.697				F = 15.692	
	p = 0.119		p < 0.001				p < 0.001	
	df = 3		df = 3				df = 3	

<sup>a</sup>VL = Very Low  
L = Low  
LM = Lower Middle  
UMH = Upper Middle and High  
<sup>b</sup>HAZ refers to Height for Age Z-scores (standard deviations above or below a World Health Organisation reference median)  
Source: Authors' survey, 1993

deviations above or below a reference median (labelled HAZ). While this measure of stunting is sometimes interpreted as a measure of chronic malnutrition, it is more accurately viewed as evidence of malnutrition sometime in the past, and probably over an extended period of time (Gibson, 1990).

Several points should be made regarding the data in table 5. Children in farming households had significantly lower levels of stunting, particularly in the two lowest income groups, during both rounds of the survey. There was a noted difference even in the lower-middle income group. It should also be noted that within the farming group, there is no significant difference between the highest and lowest income group in height for age, while the difference between the highest and lowest groups among non-farming households is pronounced and significant. There is less difference between farming and non-farming groups with regard to wasting or acute malnutrition, but our data presented little indication that wasting is a problem in Kampala, an observation confirmed by others (Riley, 1987 and Kaijuka et al., 1989).

Table 4 presents a bivariate comparison of children in farming and non-farming household controlling only for income. Multivariate analysis confirms the relationship between urban farming and nutritional status, especially in the lower income groups. Three main factors mediate this relationship: adequacy of the diet, overall sufficiency of food and the total time that mothers can care directly for their children. These data tend to confirm the hypothesis that farming serves as a long-term buffer against malnutrition that is largely unaffected by income, and provides the strongest evidence to urban policymakers that urban farming may, in fact, have a beneficial impact on public health in the city through mitigating the impact of economic hard times on widespread malnutrition. But the benefits of this impact accrue mainly to those able to gain access to land (Maxwell, 1995).

To summarise this brief overview of urban farming in

Kampala, several salient points stand out. Urban farming is an activity that cuts across virtually all social, ethnic, income, age and educational groups in the city. Yet it is to a very large extent, an activity carried out by women, and while middle and upper income groups engage in the practice, it is particularly critical to the nutritional status of low income groups. The suspected deleterious impacts of urban farming on public health, while perhaps not to be ignored, are certainly difficult to analyse in a city with such abundant non-agricultural animal and plant life. However, because of the demonstrated impact on nutrition and food security, a demonstrable public health benefit does result from the efforts of urban farmers. These factors are all relevant to a discussion of the legal and policy status of urban agriculture.

### The Institutional and Policy Context

Underlying the practice of urban agriculture in Kampala is the fact that it is technically illegal. Different municipal authorities do not agree on the specific statutes or bylaws which make farming illegal, but they all agree that it is. Reference is usually made to three pieces of legislation. The Urban Authorities Act of 1964 empowers city governments to make bylaws governing economic activities in areas under municipal jurisdiction, and it is these bylaws that are the most commonly cited by officials in explaining the legal status of urban farming. Under the Public Health Act of 1969, urban agriculture could be defined as a 'public nuisance' but it is not explicitly mentioned. The Town and Country Planning Act of 1964 also does not mention agriculture, but it grants municipal authorities power over land use. Since agriculture is not an explicitly planned urban land use, it can be interpreted as 'illegal'. Regulation of livestock-keeping in cities is specifically mentioned in the Town and Country Planning Act, but cultivation is not discussed in any of the national legislation. The legislation empowers municipalities to enact local bylaws, but does not specify their content.

Despite repeated attempts both in 1988–89 and 1993 to review municipal bylaws in Kampala, we were never able to get access to them. In 1993, we concluded that while such bylaws probably existed at some point, documentation of their existence may have been lost during the chaotic years of public administration in Kampala and the bylaws have never been revived.

Various respondents, including a number of local political leaders throughout the city, noted that there had been a series of 'decrees' during the Amin period, some of them from Amin himself, alternatively encouraging people to cultivate so as to clear areas of the city that had grown up in tall grass, and exhorting people to stop farming because it made the city look 'bushy'. These were not formal decrees, they were mostly announcements on Radio Uganda. At some point in the mid to late 1970s, one of these decrees made it illegal to cultivate crops over a few feet high for 'security' reasons. In other words, maize, cassava, plantains, sugarcane, etc. would not be tolerated, but beans, vegetables and sweet potatoes would. This was followed by a major crop-slashing operation in a number of areas of the city. While the outcry over the crop-slashing was such that no subsequent city authority has ever tried a massive operation again, the 'no-crops-higher-than-two-feet' rule is still commonly cited.

Though officials we interviewed rarely expressed the view openly, the 'legal status' of urban farming may be due more to a normative view held by city authorities than to either municipal bylaws or national legislation. This normative view holds that the city should be a modern, well-organised place. The 'bushy' appearance of a city in which people are farming every piece of open land may imply that the city is not being professionally managed. The views of city officials are evolving—indeed there were fewer complaints in 1993 than in 1988–1989 from farmers about harassment by municipal authorities, although, as the vignette in the prologue indicates, harassment and crop-slashing do still occur. However, direct harassment of farmers and slashing of crops is only one issue related to the legal status of urban farming. Officials of the Ministry of Agriculture and various non-governmental organisations noted that they would have an interest in offering various forms of project support to small-scale urban farmers, but they currently shy away from the idea because of the legal status, or at least the perceived legal status, of urban agriculture.

This set of legal circumstances has three impacts on urban agriculture. First, it hinders the more commonly thought of forms of assistance to small farmers in terms of inputs, credit and training (some of which occurs anyway, in spite of the lack of policy support for it). Second, it prevents specific programmes from being formulated in areas such as soil and water conservation, wetland degradation and control of livestock wastes, all of which do present real environmental and health problems in the densely populated, built-up area that constitutes the city. Third, it prevents some of urban agriculture's potential to recycle waste (Smit and Nasr, 1992), and leaves land-use planning in the somewhat anomalous situation that over half of the land in the city is being used 'illegally' (Uganda, 1992a).

#### (a) Facilitating the Research/Policy Dialogue

The strongly-held views of urban authorities on the one hand, and the hypothesis on the other that urban farming represents an important strategy of urban women to protect the food security of their children and families, led us to believe there was an urgent need not only to collect and analyse data measuring the impact of urban farming, but to undertake the research in such a way as to facilitate a dialogue between researchers and policy makers, and ultimately to facilitate a dialogue between urban farmers themselves and policy makers<sup>4</sup>. We devised a methodological process whereby the views of a broad range of policy makers were sought early in the research, after which we attempted to maintain contact with these policy makers, asked them to comment on early findings or interpretations of findings, and, in many cases, asked them to accompany us in the field. This process helped us to further understand official's worries about urban farming; it also helped us to identify those whose ideas on the subject were different from the above description, or who were open to change. We recognised early on that the difference in views was not just between the municipal bureaucracy and ourselves, or the bureaucracy and urban farmers: local political leaders in the city often differed sharply with municipal authorities over not only urban agriculture, but a whole range of informal economic activities.<sup>5</sup>

Toward the end of our field work, with supplementary funding from the International Development Research Centre, we organised a day-long workshop/seminar to which we invited members of the research community and the municipal and ministerial policy makers and authorities with whom we had maintained contact. We also invited many of the local political leaders from areas of the city where we had carried out field work, and representatives of the individuals and households whom we had interviewed, including urban farmers and some respondents who were not farmers. A portion of the workshop was devoted to a presentation of our research findings, but much of the day was spent in debate. The format of the workshop meant that skeptical municipal authorities were often not engaged in a debate with the researchers (ourselves), but either with their own colleagues who were also present, with local political leaders, or, in several heated exchanges, with the very women who do the bulk of the farming in the city.

Whereas many urban officials had little time to discuss urban agriculture in 1988–1989 and many were openly skeptical about our research in early 1993<sup>6</sup> there was a notable thawing of official attitudes by the end of 1993. Our research was only one of several possible explanations for this change in view. A long-range planning group within the Kampala City Council funded by the World Bank First Urban Project during roughly the same time period as our field work sought to legitimise and incorporate into urban planning efforts small-scale and informal sector activities of all types in the city (van Nostrand, 1993). The late 1980s and early 1990s have seen considerable mobilisation of informal-sector actors themselves in protection of their livelihoods, particularly through local politics. While urban farmers are not organised in the same manner as are, for example, the hawkers who

carry out much of the informal retailing in the city, or the taxi and mini-bus owners who constitute the city's informal transportation system, urban farmers have been active in politics at the most local level, and the impact of this has not gone totally unnoticed at higher levels.

In 1988–1989 it was quite common simply to be told by officials that there was nothing to discuss about urban agriculture. In 1993, however, many interviews with officials ended in virtually reversed roles—with officials asking us for information about urban farming rather than vice versa. At the seminar/workshop, urban planners and city political leaders generally agreed that farming in the city should perhaps be regulated, but that its current legal status was both unfair and unproductive and does not address the real areas of concern about health and environmental hazards.

A recently-adopted long-term physical plan for Jinja, Uganda's second largest city, actually promotes some land use for agricultural purposes, both for environmental protection (preservation of green-belt areas), and in recognition of its prevalence in the city (Jinja City Council, 1993). Similar recommendations have been formally made in the case of Kampala's long-term planning (van Nostrand, 1993).

#### **(b) Specific Policy Implications in Kampala**

Provided that some space has been created for dialogue between urban farmers, political leaders and municipal authorities about the merits of urban agriculture, some comment is required regarding specific initiatives that could be undertaken to support the practice. Several categories of suggestions could be offered and include the legal status of farming, environmental concerns and urban land policy.

While the precise legal statutes regarding urban agriculture were never located and in fact probably no longer exist in written form, virtually all respondents in this research agreed that farming in Kampala is, in some way, technically illegal. The consensus arising out of the workshop conducted with policy makers, RC leaders, researchers and urban farmers at the conclusion of field work in 1993 was that the legal status of urban agriculture was unfair and unhelpful and should therefore be changed (Maxwell, 1993b). Unfortunately, there is no one bylaw that can simply be deleted from the books. There is, rather, a three-decade long series of decrees, written and unwritten rules and their interpretations, and biases against urban agriculture. These can be changed, but they cannot be wiped out by administrative fiat or a political vote. Underlying these interpretations and biases are two fundamental issues regarding urban planning and urban management.

The first is the question of whether urban planning, or development planning more broadly, is primarily a technical process to be engaged in only by technically trained individuals, or a political process in which everyone is involved. Clearly, the preparing of detailed physical plans is a technical process, but the determination of priorities in what activities are planned for what locations is, or ought to be, a broadly-based political process. The mode of local politics in Kampala and elsewhere in Uganda<sup>7</sup> is fundamentally based

on this principle, but political leaders are often at odds with the technical staff of the KCC over precisely this issue. Urban agriculture is only one of many examples that could be raised. The second is that, to some extent, the formulation and preservation of bylaws relates more to the defining of an ideal city than to the management of a real city. So long as this is the case, and so long as farming is viewed as something that simply does not belong in the city, the chances of legalising farming in the city are diminished, even though planners are aware that over half the land in the city is used for farming.

Many bylaws simply abolish certain unwanted practices—urban agriculture is just one of many examples. This clearly does not help in addressing whatever it is that is undesirable about the unwanted practice. A primary example is the environmental impact of urban agriculture, particularly in a physical location such as Kampala where much of the land available for farming has been deemed unattractive for other forms of land use. Several other important issues arise including soil and water conservation; the protection of wetlands and the role of wetlands in the preservation of the urban ecology; the potential for urban waste recycling and the possibility of the pollution of foodstuffs grown in cities; and the health impact of livestock production in densely populated areas. All these certainly urgently require attention. Yet, if the general practice of urban agriculture remains illegal, little can be done to regulate some of its most environmentally damaging aspects, or suggest incremental improvements. A similar observation could be made with regard to offering support to women's groups that are involved in farming—a number of NGOs in the city expressed interest, but most were somewhat afraid of the legal implications. All these issues suggest that the legal status of urban agriculture should be changed.

Resolution of the legal issue would also permit the formulation of a land-use policy for urban agriculture. Access to land for farming in Kampala has to some extent taken advantage of niches created by the complexity of land tenure in the city and by administrative turmoil. Institutional reforms in urban land are currently being implemented or proposed that would increase the tax base and streamline urban land administration (Nsamba-Gayiiya, 1993 and Mabogunje, 1992), and which would represent a substantial threat to continued informal access to urban land for farming.<sup>8</sup> The extent of agriculture within the city and the proportion of the population that relies on urban agriculture as an important safeguard to food security are both important considerations in a land-use policy. Such a policy would, at a minimum, address the issues of mixed use zoning, permanent designation of certain areas for farming as 'productive green belts', and the question of compensation for eviction or loss of land for farming.<sup>9</sup>

In her wide-ranging review of urbanisation in Africa, Coquery-Vidrovitch (1991) suggested that urban policy should be encouraged to improve upon, not suppress, informal economic activities. Altering formal urban planning procedures or zoning and land-use ordinances to enable the growth of informal economies is a notoriously difficult process. Little research has been carried out on the ways in

which formal political processes at the local level incorporate or accommodate informal economic activities. There is a need for such research, not just with regard to urban agriculture, but also to informal economic activities of many types in many places, if urban authorities are to be able to play a genuinely facilitative rather than prohibitive role. This paper has outlined, both procedurally and substantively, one approach to such research.

### Notes

- <sup>1</sup> In addition to the works just mentioned, this includes global initiatives that have resulted (or will result in the near future) in publication of books on the subject by the International Development Research Centre of Canada (Egziabher, Memon, Mougeot, Lee-Smith, Maxwell and Sawio, 1994), and the UN Development Programme (Smit, Nasr and Ratta, forthcoming). Entire issues of several journals have recently been devoted to the topic (see *Hunger Notes*, Vol. 18(2); *IDRC Reports* October, 1993; *International AgSieve*, Vol.6(2); and *ILEIA Newsletter*, Fall, 1994, as well as this edition of *African Urban Quarterly*). In 1987, when this research first began in Kampala, a computerised literature search turned up a total of one reference to urban agriculture in Africa; a comprehensive search today might turn up 75–80 references.
- <sup>2</sup> Findings from our study question this interpretation, suggesting rather that urban farming is largely a women's strategy. Responsibility for the provision of food is one of the most contentious issues in urban intra-household relations (Maxwell 1994a and 1994b). This point is important in the consideration of policy alternatives.
- <sup>3</sup> The precise figure is 473,800 out of a population of roughly 900,000 in 1993. This figure is conservatively calculated by taking the 1991 Housing and Population Census figures (Ministry of Planning and Economic Development, 1992) for the number of households in Kampala, the lowest of the three projected population growth rates for the city (van Nostrand, 1993), and survey estimates for the proportion of households engaging in agriculture in the city and for average size of household engaging in agriculture. With the exception of the figure for the population of the city, all of these are probably underestimated. And this calculation does not account at all for commercial production within the city.
- <sup>4</sup> These included officials from Kampala City Council, the District Administrator's Office, the Ministries of Agriculture, Lands, Housing and Urban Development, Health, and Economic Planning.
- <sup>5</sup> In Kampala, as elsewhere in Uganda, local politics is organised under the Resistance Council (RC) System, a pyramidal system where at the most localised level, there is direct democratic participation, but where the elected leaders at one level become the 'constituency' at the next higher level in the system—in other words, ward, division and city-wide political leaders are elected indirectly. We interviewed political leaders at various levels and locations within the city throughout the RC system and found markedly different views towards urban farming than among bureaucratically appointed municipal authorities.
- <sup>6</sup> In 1989, an interview was terminated rapidly when the officer concerned said that urban agriculture was illegal and he did not grant interviews on 'criminal activities' (Maxwell and Zziwa, 1992:53).

- <sup>7</sup> The Resistance Council System, see note 5 *supra*.
- <sup>8</sup> This paper has not analysed in detail the question of informal access to urban land for agricultural purposes. The majority of urban farmers do not own or hold customary rights to the land they farm; about two-thirds of all parcels being farmed had been accessed through some informal means—illegal sub-division, borrowing and squatting being the most common means. New tenure rules that crack down on these practices, or take away the incentives for land lending, would have an obvious impact on urban farming. See Maxwell (1995) and (forthcoming).
- <sup>9</sup> In late 1994, new land-use regulations were adopted by the Kampala City Council that, among other things, permit "home based agriculture, including the growing of crops and the keeping of livestock." (Kampala City Council, 1994: 3)

### References

- Atkinson, S. (1992). *Food for the Cities: Urban Nutrition Policy in Developing Countries*. Urban Health Program, Health Policy Unit. Department of Public Health and Policy, London School of Hygiene and Tropical Medicine.
- Banugire, F. (1985). "Class Struggle, Clan Politics and the 'Magendo' Economy", *Mawazo* Vol. 6 No. 2.
- Bart, C. (1994). *Urban Food Security: A Guide to Critical Issues*. Atlanta: CARE Food Security Unit.
- Basirika, E. (1992). *Structural Adjustment and Women in the Informal Sector: A Study of Market Women*. Friedrich Ebert Foundation/Uganda Economics Association.
- Bibangambah, J. (1992). "Macro-Level Constraints and the Growth of the Informal Sector in Uganda", in J. Baker and P. O. Pedersen (eds) *The Rural-Urban Interface in Africa*. Uppsala: Scandinavian Institute of African Studies.
- Bigsten, A. and S. Kayizzi-Mugerwa (1992). "Adaption and Distress in the Urban Economy: A Study of Kampala Households", *World Development* Vol. 20 No.10.
- Chew, D. (1990). "Internal Adjustments to Falling Civil Service Salaries: Insights from Uganda", *International Labour Review* Vol. 18.
- Coquery-Vidrovitch, C. (1991). "The Process of Urbanisation in Africa", *African Studies Review* Vol. 34 No.1.
- Cornia, G. et al. (1987). *Adjustment With a Human Face*. Oxford: Clarendon Press.
- Dettweiler, S. (1985). *Senoufo Migrants in Bamako: Changing Agricultural Production Strategies and Household Organization in an Urban Environment*. Bloominstein: Unpublished Ph.D. dissertation, Indiana University.
- Egziabher, et al. (1994). *Cities Feeding People*. Ottawa: IDRC Books.

- Filliam, E. (1993). "City Farmers Face KCC's Wrath", *Monitor*, June 11: 4.
- Freeman, D. (1991). *A City of Farmers: Informal Urban Agriculture in the Open Spaces of Nairobi, Kenya*. Toronto: McGill University Press.
- Gibson, R. (1990). *Principles of Nutritional Assessment*. New York: Oxford University Press.
- Guyer, J. (1987). *Feeding African Cities*. Bloomington: Indiana University Press.
- International Labour Organisation (1989). "African Employment Report, 1988". Addis Ababa: ILO/JASPA.
- Jamal, V. (1987). "Ugandan Economic Crisis: Dimensions and Cure", in Dodge and Wiebe (eds) *Beyond Crisis: Development Issues in Uganda*. Kampala: Makerere Institute of Social Research.
- Jamal, V. (1988). "Coping Under Crisis in Uganda", *International Labour Review* Vol. 128, No. 2.
- Jamal, V. and J. Weeks (1987). "The Vanishing Rural-Urban Gap in Sub-Saharan Africa", *International Labour Review* Vol. 127 No. 3.
- Jamal, V. and J. Weeks (1993). *Africa Misunderstood*. London: MacMillan.
- Jinja City Council (1993). *Recommended Jinja Structure Plan, 1994*. Jinja: Jinja City Council.
- Kaijuka, E. et al. (1989). *Demographic and Health Survey*. Entebbe: Ministry of Health.
- Kampala City Council (1994). *Kampala Structure Plan. Annex 1: Land Development Regulations*. Kampala: Kampala City Council.
- Lee-Smith, D. et al. (1987). *Urban Food Production and the Cooking Fuel Situation in Urban Kenya*. Nairobi: Mazingira Institute.
- Loxley, J. (1989). "The IMF, the World Bank and Reconstruction in Uganda", in P. Campbell and M. Loxley (eds) *Structural Adjustment in Africa*. New York: St Martin's Press.
- Mabogunje, A. (1990). "Urban Planning and the Post-Colonial State in Africa: A Research Overview", *African Studies Review* Vol. 33 No. 2.
- Mabogunje, A. (1992). *Perspectives on Urban Land and Urban Management Policies in Sub-Saharan Africa*. World Bank, Washington, DC: World Bank Technical Paper Number 196.
- Mamdani, M. (1990). "Uganda: Contradictions of the IMF Programme and Perspectives", *Development and Change* Vol. 21.
- Manyire, H. (1993). *Macro Trends, Micro Processes and Emerging Social Policy Issues: Some Evidence from Urban Women's Market Trading in Uganda*. Paper presented to the Annual Meeting, Canadian Association of African Studies, Toronto, May 12-15.
- Maxwell, D. (1993a). *Land Access and Household Logic: Urban Farming in Kampala*. Kampala: MISR Research Paper, Makerere Institute of Social Research.
- Maxwell, D. (1993b). *Seminar Report: Farming in the City*. Kampala: Makerere Institute of Social Research.
- Maxwell, D. (1994a). *Unplanned Responses to the Economic Crisis? Urban Agriculture in Kampala*. Paper presented to the Workshop on "Developing Uganda", Centre of African Studies, University of Copenhagen, held at Lyngby Landbrugsskole, Roskilde, Denmark, June 2-5. Forthcoming in N. Hansen and P. Twaddle (eds), *Developing Uganda*. London: James Currey.
- Maxwell, D. (1994b). *Internal Struggles over Resources, External Struggles for Survival: Urban Women and Subsistence Household Production*. Paper presented to the 37th Annual Meeting of the African Studies Association, Toronto, November 3-6.
- Maxwell, D. (1995). *Labour, Land, Food, and Farming: A Household Analysis of Urban Agriculture in Kampala, Uganda*. Ph.D. Dissertation, University of Wisconsin-Madison.
- Maxwell, D. (forthcoming). "Alternative Food Security Strategy: A Household Analysis of Urban Agriculture in Kampala", *World Development*.
- Maxwell, D. and S. Zziwa (1992). *Urban Farming in Africa: The Case of Kampala, Uganda*. Nairobi: ACTS Press.
- Maxwell, D. and S. Zziwa (1993). "Urban Agriculture in Kampala: Indigenous Adaptive Response to the Economic Crisis", *Ecology of Food and Nutrition* Vol. 29.
- Mbiba, B. (1995). *Urban Agriculture in Zimbabwe: Implications for Urban Management, Urban Economy, The Environment, Poverty and Gender*. Harare: University of Zimbabwe.
- Memon, P.A. and D. Lee-Smith (1993). "Urban Agriculture in Kenya", *Canadian Journal of African Studies* Vol. 27 No. 1.

- Mingione, E. (1991). *Fragmented Societies: A Sociology of Economic Life Beyond the Market Paradigm*. Oxford: Basil Blackwell.
- Mlozi, M.R.S., I. J. Lupanga and Z. S. K. Mvena (1992). "Urban Agriculture as a Survival Strategy in Tanzania, in Baker and Pedersen (eds) *The Rural-Urban Interface in Africa*. Uppsala: The Scandinavian Institute of African Studies.
- Mvena, Z.S.K. et al. (1991). *Urban Agriculture in Tanzania: A Study of Six Towns*. Morogoro, Tanzania: Sokoine University of Agriculture.
- Naipaul, V.S. (1981). "A New King for the Congo: Mobutu and the Nihilism of Africa", in *The Return of Eva Peron*. New York: Vantage Books.
- Nsamba-Gayiiya, E. (1993). *Report of the National Workshop on Urban Land Policy and Management*. Kampala: Ministry of Lands, Housing and Urban Development.
- Obbo, C. (1991). "Women, Children and a 'Living Wage' ", in N. Hansen and P. Twaddle (eds) *Changing Uganda*. London: James Currey.
- Ochieng, E. (1991). "Economic Adjustment Programmes in Uganda, 1985-8", in N. Hansen and P. Twaddle (eds) *Changing Uganda*. London: James Currey.
- Rakodi, C. (1988). "Urban Agriculture: Research Questions and the Zambian Evidence", *Journal of Modern African Studies* Vol. 26 No. 3.
- Riley, I.E. (1987). *Nutrition and Health Survey of Kawempe Sub-District*. Kampala: Save the Children Fund.
- Sanyal, B. (1985). "Urban Agriculture: Who Cultivates and Why?", *Food and Nutrition Bulletin* Vol. 7 No. 3.
- Sanyal, B. (1986). *Urban Cultivation in East Africa*. Paris: Food and Energy Nexus Project, United Nations University.
- Sawio, C. (1993). *Feeding the Urban Masses? Towards an Understanding of the Dynamics of Urban Agriculture in Dar es Salaam, Tanzania*. Unpublished Ph.D. Dissertation, Clark University.
- Smit, J. and J. Nasr (1992). "Urban Agriculture for Sustainable Cities: Using Waste and Idle Land and Water Bodies as Resources", *Environment and Urbanisation* Vol. 4 No. 2.
- Smit, J. et al. (forthcoming). *Urban Agriculture: A Neglected Resource for Food, Jobs and Sustainable Cities*. Washington: Kumarian Press.
- Southall, A. and P. Gutkind (1957). *Townsmen in the Making: Kampala and its Suburbs*. Kampala: East African Institute of Social Research.
- Streifeller, F. (1987). "Improving Urban Agriculture in Africa: A Social Perspective", *Food and Nutrition Bulletin* Vol. 9 No. 2.
- Uganda, Government of (1992a). *City of Kampala: Revision of Structure Plan*. Kampala: Ministry of Land, Housing and Urban Development, Department of Physical Planning.
- Uganda, Government of (1992b). *The 1991 Population and Housing Census*. Entebbe Ministry of Planning and Economic Development: Department of Statistics.
- van Nostrand, J. (1993). *Kampala Urban Study Phase I Report*. Kampala: John van Nostrand Associates.
- von Braun, J. et al. (1993). *Urban Food Insecurity and Malnutrition in Developing Countries: Trends, Policies, and Research Implications*. Washington, DC: International Food Policy Research Institute.
- Wayira, J.R.M. et al. (1992). *Report on Ecological Malaria Control Pilot Project*. Kampala: Kampala City Council.
- World Bank (1989). *Sub Saharan Africa: From Crisis to Sustainable Growth*. Washington, DC: World Bank.
- World Bank (1993). *Uganda: Agriculture*. Washington DC: The World Bank.
- World Commission on Environment and Development (1987). *Our Common Future*. Oxford: Oxford University Press.

# GeoJournal

*An International Journal on Human Geography  
and Environmental Sciences*

**Editors:**

**H. van der Wusten**

*University of Amsterdam, Dept. of Human Geography, the Netherlands*

**O. Gritsai**

*Russian Academy of Sciences, Moscow, Russia*

**Editorial Board:**

**Ewan Anderson, UK; M. Barlow, Canada; Georges Benko, France; Stanley D. Brunn, USA; Cesar N. Caviedes, USA; S. Conti, Italy; Claudio Egler, Brazil; Anton Gosar, Slovenia; Yehuda Gradus, Israel; G. Heinritz, Germany; Arild Holt-Jensen, Norway; C. Gregory Knight, USA; David B. Knight, Canada; Leszek A. Kosinski, France; Vladimir Kotlyakov, Russia; Yasuo Miyakawa, Japan; B. Messerli, Switzerland; A. Paasi, Finland; D. Rumley, Australia; Sam Ock Park, South Korea; Ulf Strohmayer, UK; T. Strykiewicz, Poland; David Turnock, UK**

*GeoJournal* is an international periodical focused on the links between the transformation of modern society, technological development and environmental change, as interpreted by human geography and related sciences. The sphere of interest of the journal encompasses all relevant processes reshaping human activity patterns in different parts of the world, the methods of their analysis and the forms of application of geographical knowledge in planning and forecasting. The editors are committed to make *GeoJournal* a forum for scientific discussions going on within the International Geographical Union as well as a vehicle for the dissemination of IGU information. It is their intention to encourage high quality contributions from a wide variety of national backgrounds and substantive viewpoints for presentation to the members of the international scientific community, geographers and others interested in this field.

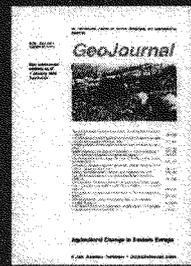
**Subscription Information:**

**ISSN 0343-2521**

1998, Volumes 44-46 (12 issues)

Subscription Rate: NLG 2385.00/USD 1224.00, including postage and handling.

P.O. Box 322, 3300 AH Dordrecht, The Netherlands  
P.O. Box 358, Accord Station, Hingham, MA 02018-0358, U.S.A.



<http://www.wkap.nl>

**Kluwer  
academic  
publishers**



**URBAN AGRICULTURE. FOOD, JOBS AND SUSTAINABLE CITIES**by **United Nations Development Programme**

(New York: United Nations Development Programme, 1996, 302 pp. soft cover, price not available)

**URBAN AGRICULTURE IN ZIMBABWE. IMPLICATIONS FOR URBAN MANAGEMENT AND POVERTY**by **Beacon Mbiba**

(Aldershot: Avebury, 1995, ISBN 1 85628 857 9, 220 pp., Hardboard, price not available)

With the rapidly growing urbanisation in the world—and particularly in the developing countries—the literature on urban agriculture is also growing. Many publications regarding the various aspects of urban agriculture have seen the light during recent years. Hence, there is a need for an overview of ‘where we stand’ as far as urban agriculture is concerned. *Urban Agriculture. Food, Jobs and Sustainable Cities*, published by the United Nations Development Programme (UNDP), provides this overview. The book was written for the second United Nations Conference on Human Settlements (Habitat II) in June 1996. It has four main purposes (p. xvii): (1) to present a comprehensive picture of urban agriculture in Asia, Africa and Latin America; (2) to define a distinct industry that needs to be recognised and treated as such; (3) to persuade leaders in government, non-governmental organisations, research institutions and other public and private entities to conduct research, support action projects and eliminate unnecessary constraints to the growth of the urban agriculture industry; and (4) to foster a climate that empowers practitioners and the agencies that back them to fulfil the industry’s potential for improving public well-being and the quality of urban life. Because of these broad and ambitious objectives the book is “neither a technical how-to manual nor an academic document” (p. xxiv) but something in-between and is meant for a wide array of readers.

The book consists of four parts. Part I consists of a conceptual and an historical chapter. Part II deals with the farmers themselves, with the locations where farming is practised, with the type of farming and produce, and with the organisations influencing urban agriculture. In Part III the benefits, problems and constraints concerning urban agriculture are outlined. Part IV discusses the future of urban agriculture. The book is not just based on earlier studies, covering the period from the early 1970s up to 1995, but also on more than 300 interviews and more than 100 site visits in 18 countries in Asia, Africa and Latin America.

The book is very well-written, making it accessible to non-academics as well (which was a major purpose). For those less acquainted with urban agriculture, the book is an excellent source to start with. However, also for those who (think they) do know something about the topic, the book contains a lot of information the reader will not (yet) know, because it provides a very complete picture of the many aspects of the industry. In this context, the 50 ‘cases’ are worth mentioning as they offer a very revealing picture of the potential of the many different types of urban farming as well as the problems related to it. In short, the book is an absolute must for everybody interested in urban agriculture.

That cannot be said of *Urban Agriculture in Zimbabwe. Implications for Urban Management and Poverty*, written by Beacon Mbiba, although this book is certainly of interest. The book starts with a discussion on urban agriculture in general and on the issues and dimensions of urban agriculture in Harare (Chapter 2). The next two chapters provide the results of a study among ‘off-plot’ (on public or otherwise illegally cultivated land) cultivators and among ‘on-plot’ (in own gardens) cultivators, respectively. Both chapters contain some interesting information, although it is dealt with in a rather superficial way. Moreover, the reader would like to know more on such things as the actual use of the plots, farming techniques, inputs, and the destination of the produce. Chapter 5 is a bit of a sideline and deals with the urban maize markets. It is the only chapter which is not written by Mbiba (and is also the only chapter without typing errors). Chapter 6 deals with an issue that is very important and at the same time still very much underexposed in the urban agriculture literature, notably the role of the different government institutions. It provides the reader with an historical overview of the attitudes and policies of the different authorities in Harare, which can be described as prohibitive. In the next chapter the author lets some women cultivators speak for themselves regarding the opportunities and constraints in the Harare environment. It is a pity that what is presented is very fragmentary and concise, otherwise it could be a very revealing chapter. Chapter 8 consists of 26 photographs showing various aspects of urban agriculture in Harare. If photographs are meant to be “tools of social research”, as the author states, a good quality of the pictures is a prerequisite. Unfortunately this is not the case, but it is not clear whether the photographs or the printer of the book is to blame. The next chapter is “an experiment” and tries to analyse whether any lessons can be drawn from the European (i.e. English) garden allotments for subsistence urban cultivation in Zimbabwe. This kind of comparison is always very tricky and in fact the author does not come any further than the conclusion that in times of crisis (economic, war, etc.) urban farming becomes more important in terms of the national food supply and becomes also more accepted by the authorities. Chapter 10 is very useful in that it deals with urban agriculture as a counter-productive activity. However, the chapter is very brief, although it poses some very essential questions. The following chapter concerns a more positive example, notably the use of sewage water for farming in the peri-urban zone of Harare. Chapter 12 deals with an aspect of urban agriculture which is very controversial: urban livestock rearing. It should be added, however, that the case

described here is different from what is usually considered as urban livestock rearing in that it concerns herds of cattle from outside the town (Chitungwiza) that are herded on the open fields that exist within the city boundaries. Therefore the conclusion that “laws that prohibit cattle in urban settlements are not as far removed from public opinion as others may want us to believe” (p. 204) is not very well founded.

On the whole, the book is a bit disappointing in two senses. First, the structure of the book is rather fragmentary. The title of the book suggests that the reader will get a thorough picture of urban farming in Zimbabwe. Instead, the book discusses a number of rather diversified aspects of urban agriculture in this country. A better title would have been “Aspects of Urban Agriculture in Zimbabwe”. This is probably due to the fact that “the book is not based on one

huge single study but on relatively small subject specific studies conducted over the years” (p. 6). Secondly, the presentation of the results of these specific studies remains rather superficial. To state that the book “goes a long way in filling the gaps existing in the literature on Urban Agriculture in Africa” (p. 211) is somewhat exaggerated. Still, the author raises fundamental questions and some of them have so far hardly been dealt with. Therefore, the book is certainly worth reading for those interested in the topic of urban agriculture.

Dick Foeken  
African Studies Centre  
P.O. Box 9555  
2300 RB Leiden  
The Netherlands.

**THE ROLE OF URBAN AGRICULTURE FOR FOOD SECURITY IN LOW INCOME AREAS OF NAIROBI****by Alice M. Mwangi**

(African Studies Centre, University of Leiden: Food and Nutrition Studies Programme, Report Number 54/1995, 1995, Soft cover, 77 pp., price not available)

Increasing evidence of the growth of urban poverty and food insecurity in Africa over the past decade has paralleled the increased research attention given to the practice of semi-subsistence agriculture in African cities. Yet, despite the frequently repeated claim that urban agriculture (UA) contributes to both improved food security at the household level and increased overall urban food supplies, such claims are rarely empirically tested. This study by Alice Mwangi of two low-income areas in Nairobi, therefore, is a welcome addition to the literature on UA, because it addresses the household element of this claim in a cross-sectional, comparative manner.

Nairobi is, in fact, becoming one of the best-studied cities in Africa where UA is concerned and the literature on UA in East Africa is beginning to be characterised by certain 'stylised' facts: The primary motivation for agricultural production among low-income city dwellers is to have a source of food, not a source of income; crops produced are, therefore, primarily relatively low (economic) value staple food crops; UA is primarily a women's activity; and the participation of low-income groups in UA is primarily constrained by lack of access to land. Mwangi confirms all of this with regard to both farming and non-farming respondents in her study.

The study tests two basic hypotheses: First, households engaged in UA have better food security and better nutritional status in children under age five (in comparison to non-UA households); and second, technical assistance in UA from an NGO or other organisation can further improve food security and nutritional status. The study confirms both of these hypotheses by comparing three low-income groups in two Nairobi neighbourhoods: households not engaging in urban agriculture; households engaging in urban agriculture on their own; and households engaging in urban agriculture with assistance from an NGO—the Undugu Society Urban Agriculture Project, or USUAP. In general, households participation in the USUAP programme had higher levels of per capita caloric intake, and better nutritional status among pre-school children than other urban farmers not receiving technical assistance. This second group had higher caloric intake and better nutritional status than the third group who do not engage in any kind of UA.

Particularly important to note is that the proportion of food consumed by these households originating from their own farming is not that high: Among the USUAP farmers, for instance, it is only 5% of caloric intake. This implies that the impact of UA is not so much in terms of improving overall household food availability as it is in terms of having a source of food available when cash is short for market purchase. Market purchase remains, by far, the major source of food

consumed; but the erratic nature of urban income sources is often mentioned as a constraint to food security, especially in the short-term.

The conclusions of the study are partially limited by the size of the sample. The statistical significance of the difference in food and nutrition outcomes among these groups is not stated, but the differences are fairly small. It is also not entirely clear whether the differences found are due to urban agriculture, or to some other, pre-existing factor. The USUAP group and the other urban farming group rank higher on a 'welfare index' and in terms of stated income. It is not clear from the study whether these households are better off because they engage in urban farming, or they have better food security because they are wealthier anyway: such a question is very difficult to address without longitudinal data. Other studies in eastern and southern Africa have noted that UA is often not a viable prospect for the poorest urban residents. Mwangi does note, however, that in terms of their own perceptions, USUAP participants are better off having joined the project.

This raises a thorny methodological problem for measuring the impact of UA on food security and nutrition, implied but not explicitly stated by Mwangi. In order to assess impact, comparison across farming and non-farming households must somehow control for income, but this is extremely difficult under circumstances where income sources are numerous and varied (Mwangi notes multiple sources of income/household in her study), and where subsistence production is more highly valued by the producer than simply its 'farm-gate' or even 'retail' price. This remains a challenge to future research on the food security impact of UA.

A baffling finding from Mwangi's study is the linkage (or lack thereof) between caloric intake, long-term food insecurity and nutritional status. The non-UA group had the lowest average caloric intake for the 7-day food consumption recall undertaken by the study and reported the highest number of months of food shortage (10–12 months of the year for nearly a quarter of this group). Yet there was virtually no difference in either short-term (weight-for-height) or longer-term (height-for-age) measures of under-nutrition. Does this imply that urban groups unable to gain access to land for farming have developed other, equally viable strategies to protect the nutritional status of their children? Neither the caloric intake data presented, nor the information on strategies employed to cope with food shortages, offer a ready answer to this question. This remains an important question for future research. However, Mwangi's valuable study shows that UA can have a positive impact on household food security and nutritional status. Nairobi's Undugu Society

deserves particular credit for its willingness to embrace the practice of UA despite its legal limbo (other NGOs have been reluctant to support an activity that is in contravention of municipal bylaws). But, like other preceding studies, Mwangi noted that UA is not an option for all low-income urban households. The rapid growth of low-income urban populations in Africa tends to imply that more people will be competing for the use of less land available for UA. Thus,

from one angle, it is important to improve production practices on this land, and Mwangi shows that the investment in productivity pays off in terms of food security. From another angle, however, it is important to explore and improve upon *all* the food security strategies of the urban poor.

Dan Maxwell  
Nosudri Memorial Institute for Medical Research  
P.O. Box 25  
Legon, Ghana

**ENOUGH IS ENOUGH: FOR AN ALTERNATIVE DIAGNOSIS OF THE AFRICAN CRISIS**by **Carlos Lopes**

(Uppsala: Scandinavian Institute of African Studies, Discussion Paper No. 5, 1994, paper, price GB£ 5.95)

*Enough is Enough* is a discussion paper which offers an alternative interpretation to the African crisis. The author, Carlos Lopes, is a sociologist from Guinea-Bissau. He has a PhD from University of Paris 1 Pantheon-Sorbonne, and was the founder and first director of Guinea-Bissau's National Institute for Studies and Research (INEP). He later joined UNDP where he is the current deputy resident representative in Zimbabwe.

The African crisis is characterised by heavy dependency on borrowing (financial aid); deteriorating terms of trade which are cutting the value of Africa's traditional exports; crumbling infrastructure, deteriorating or vanishing services; escalating unemployment; poverty; high child mortality to name but a few. Several views have been given as to the cause of the crisis and in most cases, Africa is blamed. The World Bank, for example, is of the view that Africa's economic problems are not primarily due to external factors but rather to internal incompetencies. The incompetencies include lack of political leadership, ignorance, poor policy-making, and so on. Indeed, a World Bank official described the first three decades of African independence as having been "an economic, political and social disaster". Africa is viewed as a "continent without direction" and considered a sick partner in the planet. It is with these perceptions and opinions about Africa that Carlos Lopes asks: Is it true that Africa has nothing to show? Are we accepting product growth rate, high population growth rate and an ever increasing external debt burden, to name but a few. He then asks: Who is to blame for this predicament? Is there a need for sharing responsibility for the failures? (p. 12). To answer the questions, the author analyses the state of the global economy between 1960 and the early 1990s. He is of the view that both donors and many western-educated African leaders are to blame for Africa's current predicament, because of their belief that development could be achieved by systematic application of economic models developed in the West and which in most cases were based on principles incompatible with the beliefs and practices of African society. He finally calls for the catharsis movement.

In chapter two, the author discusses the lessons to be learnt by Africans from the economic experience of the past decades. He asserts that Africans must understand that development is an internal effort and that application of development models, as logical and appropriate as they may sound, is bound to fail if they are not based on solid historical and cultural grounds. He cites several developmental models, from the basic needs theory to the structural adjustment programmes, which have failed to solve Africa's problems and blames this on their theoretical development outside Africa, with very little involvement of the latter. The author is of the view that for market-oriented economic policies to

succeed in Africa, the continent's economic behaviour must be understood and local cultures and traditions respected. He goes on to list some of the economic values and attitudes such as primacy of consumption over savings, among others. Lopes criticises the assumption by international financial institutions that macro-economic equilibrium in Africa will be attained through a rise in exports coming from traditional products. He argues that comparative advantage no longer works on the same principles as the 1970s; there are other competitors in the same riches with better environments and access to capital, as well as superior productivity; and that market protectionism from the North denies developing countries access; and many other assumptions not based on indigenous elements. The author also analyses the performance of those African countries that implemented the structural adjustment programmes advocated by the Breton Woods Institutions; and discovers a generally poor performance. The World Bank attributes the lower level of development in the continent to inadequate human resources, poor institution development, crumbling infrastructure and poor governance. No acknowledgement is made of the budgetary constraint of external debt and exogenous shocks. The Bank however acknowledges that the economies of various African countries are not as uniform as it had been assumed.

Chapter three of the discussion paper concentrates on discussing the major trends and challenges. One of them is the need to build social and political models based on African culture so as to be able to preserve existing capacities as well as generate new ones. However, this is impeded by the political conditionalities imposed by the donors before giving any development assistance. The other challenge is to invest in human capital progressively and not regressively to ensure future growth. The third is the need to feed the population and hence greater investment in agriculture. The fourth challenge is the need to mobilise resources within the continent without relying heavily on external funding.

The fourth chapter defines Africa's role in the world economy as well as the democratic debate and ends with a call for Africa to define its priorities. The author advocates an integrated approach to development, that is, an approach taking into consideration the linkage between the economic, political and cultural factors, all accounting for a social equilibrium. The author is of the view that for Africa to attain the desired economic growth rate, she must take control of the pace of implementation of the reform programme and also refuse conditionality.

In conclusion, the author concludes that the Africans must realize that they are the ones to develop their country, not the donors. They also have to recognise that neo-classical monetary policies have not proven adequate to the African

values. This can only be done when the feeling of defeat is defeated.

This report is an African input into the debate on problems and prospects in Africa. It is an important reading material

for both economists and policy makers in Africa. In fact, anybody concerned with the future development of the African continent should read it.

Samuel O. Akatch  
Department of Urban and Regional Planning  
University of Nairobi  
P.O. Box 30197  
Nairobi, Kenya

## **SUPPLY OF LIVESTOCK PRODUCTS TO RAPIDLY EXPANDING URBAN POPULATIONS**

**edited by R. Trevor Wilson**

(Rome: Food and Agriculture Organisation, FAO/WAAD/KSAS, 1995, 233 pp, soft bound, price not given)

The book is divided into four sections, part one consisting of four keynote papers that form the theme of the book, part two deals with the four conceptual areas that constitute the basis of livestock development systems within any set-up in the world, part three comprises nine case studies that address selected agricultural/livestock production systems in certain urban populations in Africa and Asia and part four covers the participants' deliberations and recommendations that centred on three crucial areas of livestock production, namely, policies and strategies, marketing legislation and regulations, and constraints and opportunities. Finally, there is an annex comprising of 17 abstracts from posters presented during the Symposium entitled Supply of Livestock Products to Rapidly Expanding Urban Populations which took place at Hoam Faculty Club, Seoul National University, Seoul, Korea, 16–

20 May, 1995. The pre-conference version of these proceedings was edited by W. Y. Kim and J. K. Ha and made available to participants for the conference.

All in all, the chapters are simple, well-written and relevant to the theme of the book. In addition, they give the readers, researchers and policy makers a very clear overview of the livestock development systems and the challenges that are significant to its promotion in the rapidly expanding peri-urban and urban populations worldwide.

G. E. Otiang'a-Owiti  
Department of Veterinary Anatomy  
University of Nairobi  
P.O. Box 30197  
Nairobi, Kenya



## Call for Papers

# ***Evolving Environmental Ideals*** ***Changing Ways of Life, Values and Design Practices***

## **IAPS 14 Conference**

Stockholm, July 30 – August 3 1996

*Evolving Environmental Ideals, Changing Ways of Life, Values and Design Practices* is a theme selected to promote a discussion between social, behavioural and architectural scientists, ecologists, designers, and planners. The conference should articulate the role of the built environment in ecologically conscious sustainable development.

Other contemporary areas of interest in design research can be usefully reexamined in terms of their ecological implications for the built environment. Among such issues are: the growing diversity of ways of life in contemporary societies; the impact of migration within and between countries on the quality of housing, living and working conditions; the role of new information technology in everyday life, and differences in ways of life, values and design ideals between "underdeveloped" and "overdeveloped" countries.

Cultural and social responses to environmental changes constitute important issues for discussion. In some countries, anticonsumerist ways of life, in which sharing of resources is more important than individual levels of consumption, have been fostered in various ways, including housing and other aspects of design. It may be asked whether these "postmaterialist" ways of life are gaining momentum, or waging a losing battle against other ideals, such as economic growth.

Papers, in English or French, are welcome on any subject within the broad field of person-environment studies. Instructions to authors will be sent to those who apply for more information. Prospective participants are asked to send 200–250 word abstracts by 31st October, 1995. People without papers are also welcome.

The conference is being jointly organised by the International Association for People-Environment Studies (IAPS), the Department of Architecture and Townplanning at the Royal Institute of Technology (KTH), Stockholm and the Nordic Association for Architectural Research (NA) as follows:

A limited number of key note speakers will be invited to talk on the main subthemes of the conference. The formal part of the conference will end with a panel discussion. Participants will be assigned to groups for intensive sessions according to the theme of their papers. Papers will be sent in advance to all participants in the same group.

Groups of authors may submit papers for inclusion as a symposium on a specific subject in the framework of the conference. One author should act as coordinator. IAPS Networks (Housing, Landscape, Education, Spatial Analysis, Cultural Aspects of Design, Migration and Built Form) will meet.

Excursions include field trips and sightseeing. Exhibitions, books, etc. related to the theme are welcome. The Secretariat should be informed in advance.

The conference will be held at the **Hasseludden Conference Centre**, beautifully situated in the Baltic archipelago of Stockholm. It can be reached by bus or by boat. In addition to full conference facilities, the centre offers recreation in attractive surroundings. Hasseludden offers full board. Accompanying people may enjoy the recreational facilities and the excursions.

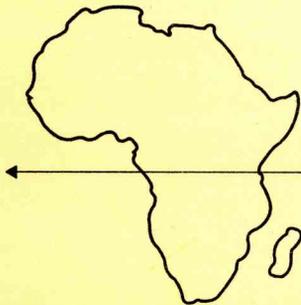
Further information is available from

IAPS 14 Secretariat, Dept. of Architecture and Townplanning  
The Royal Institute of Technology, S-100 44 Stockholm, SWEDEN  
Tel +46 8 790 85 22, fax +46 8 790 85 80 (Dick Urban Vestbro)  
E-mail: dickurba@arch.kth.se. Tel and fax +46 8 643 11 73 (Madi Gray)

---

## GUIDELINES FOR AUTHORS AND EDITORIAL POLICY

1. Authors writing for *African Urban Quarterly* (AUQ) must aim to contribute knowledge and discussion of urbanisation and planning issues of developing countries of the world. Authors should give special attention to the problem of communication with a wider audience; the use of jargon should be avoided at all costs.
  2. The Editor welcomes the submission of papers on topics relating to all aspects of urban, regional and rural planning in developing countries, especially in Africa, but papers on the following key topics will be particularly welcome: housing; the use and development of energy resources; transport and communications; employment and labour markets; marketing and service provision in urban and rural development; demographic change; surveying and planning techniques; the growth of large metropolitan areas; community health and planning; the administration of planning and development; technical cooperation and planning education and the relationships between physical and socioeconomic planning. *Publications will be in English.*
  3. The study of urbanisation and planning, in relation to the quality of human life, deals with aspects of medicine, agriculture, demography, transportation, political science, geography, history, sociology, economics, statistics, mathematics, urbanisation, anthropology, archaeology, education, law and environmental studies; and they must be brought to bear on the development of human life on rural as well as urban areas. AUQ welcomes manuscripts which focus on any of the problem areas just mentioned provided that the link between the subject treated and the central problem of the comparative urbanisation and planning in Africa within the rest of the world is reasonably clear. In particular, we shall be happy to have manuscripts that are: (1) reports of empirical investigations; (2) studies of methodological problems; (3) studies of *real world situations* in Africa alone or compared to the rest of the world; (4) philosophical analyses of basic urbanisation and planning theories; (5) prescriptions of policy research and practice, and (6) reviews of current research, findings, information and interpretations of general interdisciplinary interest to African studies. In general, AUQ encourages and publishes quality papers to reformulate traditional ideas within the context of *quantitative and behavioural research*. AUQ IS A HEAVILY REFEREED JOURNAL.
  4. *Editorial correspondence should be addressed to:* The Editor, African Urban Quarterly, P.O. Box 74165, Nairobi, Kenya, East Africa. Telephone: +254-2-216574 or +254-2-334244 extension 2086; Telex: 22095 VARSITY NAIROBI. Cable: VARSITY NAIROBI.
  5. The acceptance of an article for the review implies an undertaking by the author(s) that the article will not be submitted to other journals and that, once published, it will not be printed in whole or part, in any form, without the Editor's written permission. There is no strict limitation on length of manuscript.
  6. Four copies of manuscripts should be submitted, typed with lines double-spaced and with wide left-hand margins.
  7. Whenever references are to be given for additional information, insert the last name of the author and the year as shown below. All references must include, whenever relevant, the name of the author(s), year, title of work, publishers and place of publication as indicated in the example given below: *book*—Obudho, R. A. (1983) *Urbanization in Kenya*. London: University Press of America; *Article*—Peil, M. (1976) "Urban Squatter Settlement: A Comparative Study", *Urban Studies* Vol. 13 No. 2: pp. 155–166; *Chapter in books*—Obudho, R. A. and G. O. Aduwo, "Small Urban Centres and Spatial Planning in Kenya" in Jonathan Baker (ed) *Small Town in Africa* Uppsala: Scandinavian Institute of African Studies, 1990, pp. 51–68; and *Conference and Seminar Papers*—Obudho, R. A. (1991) *The Role of Megacities and Spatial Planning* paper presented at the Annual Meeting of Kenya Geographical Association, Nairobi, Kenya, February 14–20, 1990.
  8. Appendices should follow immediately after the main text; any notes and references should be placed next. Acknowledgements should follow the notes, references, tables and charts.
  9. Tables should be sequentially numbered in the order in which they are referred to in the text and should be included in the text. Each table should have a brief descriptive title and source, both of which are written in lower case.
  10. Illustrations should accompany the manuscript. All maps, diagrams, charts and photographs should be referred to as 'Figures' and should be numbered sequentially in the order in which they are referred to in the article. All figures should have brief descriptive captions and sources also should be cited. All illustrations must be camera ready. Any extra work on illustrations will be charged to the author.
  11. Photographs should be good quality glossy prints, preferably whole plate (8.5 x 6.5 inches). Each should have lightly written in pencil on the back, the authors name, figure number and an indication of the top of the picture. Line drawings should be in black and should be in a form suitable for reproduction. The AUQ reserves the right to redraw illustrations.
  12. If requested, AUQ will return all illustrations to authors, but cannot be responsible for any damage incurred in plate-making.
  13. Authors will receive two free copies of the issues in which their articles appear as well as offprints copies free of charge.
-



*Published by*

**UQL AFRICAN URBAN QUARTERLY LTD.**

PUBLISHER OF ACADEMIC BOOKS AND JOURNALS WORLDWIDE

*With financial support from*

**Technical Centre for Agricultural and Rural Co-operation  
ACP-EU (CTA), Wageningen, The Netherlands**

**The French Institute for Research in Africa (IFRA),  
Nairobi, Kenya**

**International Development Research Centre (IDRC),  
Ottawa, Canada**



**Distributed by**

**SUBA Books and Periodicals Distributors Ltd.**

**P.O. Box 51336, Nairobi, Kenya, East Africa**

**Telephone: +254-2-449231;**

**Fax: +254-2-444110**

**Printed by: ICIPE Science Press**

**P.O. Box 72913, Nairobi, Kenya ● Tel: +254-2-861680-4 ● Fax: +254-2-803360/860110**

**Email: [icipe@africaonline.co.ke](mailto:icipe@africaonline.co.ke)**