

Appendices

Glossary

Aquaculture—Agriculture based within various bodies of water. It includes seaweed, duckweed, rushes, water spinaches, lilies, shrimp, fish and other seafood crops. In urban areas, aquaculture is often wastewater-based and frequently shares water space with recreation uses.

Aqua-terra farming—A system of agriculture in which water crops and land crops support each other. Land crops may include trees, vegetables, livestock and flowers; in the water, poultry, fish, vegetables and crayfish may be grown.

Community kitchen—A community-based organization that includes communal food purchase and preparation. Some community kitchens have small farms.

Companion cropping—Growing compatible crops, with one protecting the other from attacks by insects or diseases (for example, marigolds with cabbage).

Farming system—The various crop production methods used on a single farm or a system of agriculture—such as greenhouse floriculture or roadside vegetable horticulture—that has a distinct set of farming practices. This volume uses the second meaning. Aqua-terra farming (defined above) is an example of a complex farming system.

Food-shed—A basic concept for defining urban agriculture that is derived from the idea of the watershed. Maps are drawn that show the flow of a particular food from production to consumer (see chapter 1).

Fungible income—In urban agriculture, production of food as a substitute for buying it, which frees part of the household income for paying for services and other goods (see chapter 1).

Horticulture—All crops cultivated on land, including vegetables, berries and trees. Ornamental horticulture and forestry are special types. Horticulture sometimes refers more narrowly to vegetable production.

Intercropping—Growing two crops together at the same time, such as a short-season tomato and a long-season sugarcane.

Layering—Growing trees over bushes over ground-level vegetables.

Microlivestock—Small livestock including guinea pigs, guinea fowl, rabbits, pigeons, chickens, ducks, pigs and goats. In this volume, the term is used primarily in the narrower sense to mean small domesticated animals, as distinguished from poultry. Microlivestock is generally the type of livestock most suitable for small farmers in urban agriculture.

Multicropping—Refers broadly to growing a number of crops at one site, whether mixed together or not. Home gardens typically use multicropping.

Mycoculture—The systematic production of mushrooms.

Outgrower—A contract producer. Typically, a firm contracts with an outgrower for a specified production by a specified date.

Peri-urban area—An area at the fringe of the city that is in the process of converting from rural to urban land uses. The size of the peri-urban area is defined more by transportation infrastructure and uses of the land than by either city population size or distance from the centre. Thus accessibility is a key factor determining the extent of the peri-urban area. These zones are a common locus of urban agriculture.

Pisciculture—Fish production, a branch of aquaculture.

Productive landscape—A concept in which the open spaces are perceived as potentially productive rather than simply recreational or aesthetic (see chapter 1).

Throughput—The balance between inputs and outputs that flow through a community. Urban agriculture reduces a city's throughput by reusing its waste to produce food and fuel (see chapter 1).

Usufruct—The legal right to "use and enjoy" (the Latin root of the word) something that belongs to another. In urban agriculture, a usufruct permits a farmer to exploit land or water owned by another (see chapter 1).

Zero-grazing—Maintaining and feeding livestock within an enclosed area (for example, a stable or pigsty).

Sources for cases

Case 2.1

Augusto Cardich, "Native Agriculture in the Highlands of the Peruvian Andes", and Melvin L. Fowler, "Early Water Management at Amalucan, State of Puebla, Mexico", both in *National Geographic Research*, Vol. 3, No. 1 (1987); and Rex Keating, "The Chinampas", *Ecology in Practice* (Paris: Man and the Biosphere, 1981).

Case 2.2

G. Stanhill, "An Urban Agro-Ecosystem: The Example of Nineteenth-Century Paris", *Agro-Ecosystems* 3 (1977): 269–84.

Case 2.3

Linda Agerbak, "Agricultural Innovation in the City-State", *Asia 2000* (1985): 28–29; and Dr. Leong Poo Chow, *Annual Report* (Singapore: Agriculture Ministry, Primary Production Division, 1985).

Case 2.4

Food and Agriculture Organization, *Street Foods*, Food and Nutrition Paper 46 (Jogjakarta, Indonesia: FAO, 1988); and Jakarta Municipal Department of Agriculture, Horticulture Division *Annual Report*, (Jakarta: 1988).

Case 2.5

Z.S.K. Mvena, I.J. Lupanga and M.R.S. Mlozi, "Urban Agriculture in Tanzania: A Study of Six Towns", draft paper (Morogoro, Tanzania: Sokoine University of Agriculture, Department of Agriculture, Education and Extension, 1991); and 1988 census, reported in Sustainable Cities Programme, "Dar es Salaam Environmental Profile" (Nairobi: United Nations Centre for Human Settlements, 1993).

Case 2.6

Urban Agriculture Network case file; HUFACAM, *Proyecto Especial HUFACAM* (Lima: HUFACAM, 1992).

Case 2.7

Andreas Faludi and Arnold van der Valk, *Rule and Order: Dutch Planning Doctrine in the Twentieth Century*, GeoJournal Library Series 28 (Hingham, Mass.: Kluwer Academic Publishers, 1994).

Case 3.1

Urban Agriculture Network case file.

Case 3.2

Urban Agriculture Network case file.

Case 3.3

Urban Agriculture Network case file.

Case 3.4

Urban Agriculture Network case file.

Case 3.5

Urban Agriculture Network case file; P. Edwards and R.S.V. Pullin, eds., *Wastewater-Fed Aquaculture*, Proceedings of the International Seminar on Wastewater Reclamation and Reuse for Aquaculture, Calcutta, India, December 1988 (Bangkok: Environmental Sanitation Information Centre, Asian Institute of Technology, 1990); Department of Fisheries, Government of West Bengal, *Fisheries Development in West Bengal at a Glance* (Calcutta: Department of Fisheries, May 1988); and M.B. Pescod, *Wastewater Treatment and Use in Agriculture*, FAO Irrigation and Drainage Paper 47 (Rome: Food and Agriculture Organization, 1992), pp. 117–18.

Case 4.1

Urban Agriculture Network case file.

Case 4.2

Urban Resources Systems, *Urban Agriculture: Meeting Basic Needs for the Urban Poor*, prepared for UNICEF, Urban Examples for Basic Ser-

vices Development in Cities (UE-9) (New York: UNICEF, 1984); and Bishwapriya Sanyal, *Urban Cultivation in East Africa: People's Response to Urban Poverty* (Tokyo: United Nations University, Food-Energy Nexus Programme, 1986).

Case 4.3

Sergio Catao Aguiar and Jaire José Farias, "Food and Energy from Industrial Wastes", *UNU Work in Progress* 10 (October 1986): 3.

Case 4.4

Urban Agriculture Network case file.

Case 4.5

Yacouba Konaté, "Land Issues in the Peri-Urban Zone of Bamako, Mali: A Case Study of Kalabancoro"; S. Diallo and Y. Coulibaly, *Les déchets urbains en milieu démuni à Bamako* (Paris: United Nations University, Food-Energy Nexus Programme, August 1987).

Case 4.6

Z.S. Zhang, "Wastewater-Fed Fish Culture in China", in P. Edwards and R.S.V. Pullin, eds., *Wastewater-Fed Aquaculture* (Bangkok: Asian Institute of Technology, 1990).

Case 4.7

Ann Westman, "Food Production in the City", *The Hoe* 2 (fall 1986).

Case 4.8

Urban Agriculture Network case file; Juan J. Jimenez-Osornio and others, *Past, Present and Future of the Chinampas*, Maya Sustainability Report no. 1 (Riverside, Calif.: University of California, 1990); Anthony DePalma, "Mexico City Restoring Area Tilled by Aztecs", *New York Times*, 14 September 1993, p. C4; and Pablo Torres-Lima, Beatriz Canabal-Cristiani and Gilberto Burela-Rueda, "Urban Sustainable Agriculture: The Paradox of the Chinampa System in Mexico City", *Agriculture and Human Values* 11, no. 1 (1994): 37–46.

Case 4.9

Emilio L. La Rovere, *Food and Energy in Rio de Janeiro: Provisioning the Poor* (Tokyo: United Nations University, Food-Energy Nexus Programme, 1985).

Case 4.10

Urban Resources Systems, *Urban Agriculture: Meeting Basic Needs for the Urban Poor*, prepared for UNICEF, Urban Examples for Basic Services Development in Cities (UE-9) (New York: UNICEF, 1984).

Case 5.1

Emma Robson, "Duckweed: A Lowly Plant Finds a Richer Role Cleansing Waste and Creating Protein", *Source* (December 1991); Paul Skillicorn, William Spira and William Journey, *Duckweed Aquaculture: A New Aquatic Farming System for Developing Countries* (Washington, D.C.: World Bank, 1993).

Case 5.2

Julio Moscoso and Hugo L. Nava, "Reuse of Treated Pond Effluents for Fish Culture in Lima, Peru", in *Wastewater-Fed Aquaculture*, Proceedings of the International Seminar on Wastewater Reclamation and Reuse for Aquaculture, Calcutta, India, December 1988 (Bangkok: AIT, 1990); Carl L. Bartone and others, *Monitoring and Maintenance of Treated Water Quality in the San Juan Lagoons Supporting Aquaculture*, Final Report of Phases I-II of the UNDP/World Bank/GTZ Integrated Resource Recovery Project (Lima: Pan American Center for Sanitary Engineering and Environmental Sciences, 1985).

Case 5.3

"The Good Gardener", *Malaysian Strait Times*, 18 August 1993.

Case 5.4

Martin L. Price, "A Special Expanded Issue on Rooftop Gardening", *ECHO Development Notes*, no. 30 (1990); Center for Citizens Initiatives, *The Agricultural Initiative* (San Francisco: Center for Citizens Initiatives, summer 1994).

Case 5.5

Urban Agriculture Network case file; Julio Prudencio Böhr, "People's Hydroponics in Latin America", *ILEIA Newsletter* 10, no. 4 (1994): 13.

Case 5.6

Urban Agriculture Network case file.

Case 5.7

Urban Agriculture Network case file; and Z.S.K. Mvena and others, "Urban Agriculture in Tanzania: A Study of Six Towns", draft, Sokoine University, Department of Agricultural Education and Extension, Morogoro, Tanzania, October 1991.

Case 5.8

Urban Resources Systems, *Urban Agriculture: Meeting Basic Needs for the Urban Poor*, prepared for UNICEF, Urban Examples for Basic Services Development in Cities (UE-9) (New York: UNICEF, 1984).

Case 6.1

Undugu Society, *Annual Report*, 1993.

Case 6.2

J.N. Hawkins, "Shanghai's Food System", unpublished (1981); Deng Honghai, "Urban Agriculture as Urban Food Supply and Environmental Protection Subsystems in China", paper presented at the international workshop on Planning for Sustainable Urban Development, Cardiff, United Kingdom, July 1992; Urban Resources Systems, *Urban Agriculture: Meeting Basic Needs for the Urban Poor*, prepared for UNICEF, Urban Examples for Basic Services Development in Cities (UE-9) (New York: UNICEF, 1984); and Julie A. van der Bliet, *Urban Agriculture: Possibilities for Ecological Agriculture in Urban Environments as a Strategy for Sustainable Cities* (Leusden, Netherlands: ETC Foundation, Consultants for Development Programmes, 1992).

Case 6.3

AVRDC progress report summaries.

Case 6.4

Urban Agriculture Network case file; Urban Vegetable Promotion Project, ZOPP-5 planning workshop sponsored by the GTZ, Arusha, Tanzania, 28 March–1 April 1995.

Case 7.1

Urban Agriculture Network case file.

Case 7.2

Urban Agriculture Network case file.

Case 7.3

Urban Agriculture Network case file.

Case 7.4

Urban Agriculture Network case file.

Case 7.5

Julie A. van der Blik, *Urban Agriculture: Possibilities for Ecological Agriculture in Urban Environments as a Strategy for Sustainable Cities* (Leusden, Netherlands: ETC Foundation, Consultants for Development Programmes, 1992); and A.E. Boakey, "Agricultural Development on Urban Fringes" (1982).

Case 7.6

Martha Schteingart, "Social Conflicts and Environmental Deterioration", *Development: Seeds of Change*, no. 4 (1986): 56-60; and Kari Kiepi, report at a workshop on urban agriculture sponsored by the Inter-American Development Bank and the World Bank, Washington, D.C., 26 June 1995.

Case 7.7

Urban Agriculture Network case file; Christine Furedy and Dhrubajyoti Ghosh, "Ecological Traditions and the Creative Use of Urban Wastes: Lessons from Calcutta", paper presented at an international conference on the Ecological Aspects of Solid Waste Disposal, Hong Kong, December 1993.

Case 7.8

National Research Council, *Vetiver: A Thin Green Line Against Erosion* (Washington, D.C.: National Academy Press, 1993); and World Bank, *Vetiver Grass: The Hedge Against Erosion* (Washington, D.C.: World Bank, 1990).

Case 7.9

Urban Agriculture Network case file.

Case 8.1

Carl Bartone, "Chile: Managing Environmental Problems: Economic Analysis of Selected Issues", Report 13061-CH (Washington, D.C.: Environment and Urban Development Division, World Bank, December 1994).

Case 9.1

Urban Agriculture Network case file; Urban Resources Systems, *Urban Agriculture: Meeting Basic Needs for the Urban Poor*, prepared for UNICEF, Urban Examples for Basic Services Development in Cities (UE-9) (New York: UNICEF, 1984); and B. Sanyal, "Urban Agriculture: A Case Study of Lusaka", *Food and Nutrition Bulletin* 7, No. 3 (September 1985): 15-24.

Case 9.2

M. B. Pescod, *Wastewater Treatment and Use in Agriculture*, FAO Irrigation and Drainage Paper 47 (Rome: Food and Agriculture Organization, 1992).

Case 9.3

Urban Resources Systems, *Urban Agriculture: Meeting Basic Needs for the Urban Poor*, prepared for UNICEF, Urban Examples for Basic Services Development in Cities (UE-9) (New York: UNICEF, 1984); Julie A. van der Blik, *Urban Agriculture: Possibilities for Ecological Agriculture in Urban Environments as a Strategy for Sustainable Cities* (Leusden, Netherlands: ETC Foundation, Consultants for Development Programmes, 1992); Emma Robson, "China's Centuries Old Recycling: Tradition Gears for the Future," *Source* (December 1991): 6-11; and Christine Furedy, personal communication, 1993.

Case 9.4

Pro Huerta brochure, 1994; Urban Agriculture Network case file.

Case 9.5

Urban Agriculture Network case file.

Case 9.6

Urban Agriculture Network case file.

Countries cited in figures, cases and photos

This list should prove useful to readers who wish to glean from this volume information about urban agriculture in a particular country or region. "F" refers to a figure, "C" to a case and "P" to a photo.

AFRICA

Côte d'Ivoire: P/3.7, P/5.8, P/7.3, P/9.6

Eritrea: P/8.2

Ghana: C/7.5

Kenya: P/4.4, P/4.7, P/5.9, C/6.1, P/7.8

Mali: F/4.1, C/4.5

Senegal: P/5.4, C/7.3, P/7.5, P/7.7, P/8.1, P/9.5

Tanzania: P/2.3, C/2.5, C/4.4, P/4.5, C/5.6, C/5.7, C/6.4, P/6.5, P/8.3

Tunisia: C/9.2

Zaire: C/4.2, C/4.7

Zambia: C/3.1, P/3.1, C/3.3, P/3.3, P/3.5, C/9.1

ASIA AND PACIFIC

China: F/2.1, C/4.6, C/6.2, P/6.3, P/7.13, C/9.3

India: C/3.5, P/3.6, C/7.7

Indonesia: P/2.2, C/2.4, C/7.4, P/9.2

Lebanon: F/4.5, C/7.9, P/7.14

Papua New Guinea: C/5.8, P/5.10

Philippines: C/3.4, P/4.9, C/4.10, P/4.10, C/9.5

Singapore: P/2.1, C/2.3

Sri Lanka: C/7.5

Taiwan (province of China): P/4.6, C/6.3, P/6.4

Thailand: P/5.1, P/9.1

Viet Nam: C/5.3

LATIN AMERICA AND THE CARRIBEAN

General: C/2.1
 Argentina: C/9.4
 Bolivia: P/6.2
 Brazil: C/4.3, C/4.9
 Chile: C/3.2, P/3.2, P/5.5, P/5.7, C/8.1, F/8.1
 Colombia: P/3.4, C/5.5, P/5.6, P/7.6
 Costa Rica: P/4.2, P/6.1, P/7.10
 Haiti: P/4.3, C/5.4, P/5.12
 Mexico: F/2.3, C/4.1, P/4.1, F/4.3, C/4.8, P/4.8, C/7.6
 Nicaragua: P/7.2, C/9.6, P/9.7
 Panama: P/5.2, P/9.3
 Peru: P/2.4, C/2.6, C/5.2, C/7.1, P/7.1, C/7.2, P/7.4, P/7.9, P/9.4

EUROPE AND NORTH AMERICA

France: C/2.2, F/2.4
 Germany: F/2.2, P/5.11, P/7.12
 Italy: P/7.11
 Netherlands: C/2.7
 Russia: C/5.4
 United States: P/3.8, P/5.3

Cities and towns visited by The Urban Agriculture Network, 1991-95

The Urban Agriculture Network visited 18 developing countries between fall 1991 and spring 1992 during four study trips funded by UNDP. During the preparation of this report, the authors also visited cities in 12 additional countries for conferences, interviews or field observations; these cities are denoted with an asterisk (*). The towns and cities visited included a wide range of cultures, economies and climates.

EAST AND SOUTH

ASIA

India

Bhatpara
 Burdwan
 Calcutta
 New Delhi

Indonesia

Bandung
 Bogor
 Jakarta

Philippines

Cavite
 Los Baños
 Manila

Taiwan

Kaohsiung
 Taichung
 Tainan
 Taipei

Thailand

Bangkok
 Samut Sakhon

MIDDLE EAST

Egypt

Cairo*

Lebanon

Beirut*

EUROPE

France

Amiens*
 Paris*

Germany

Berlin*
 Frankfurt am Main
 Freiburg im Breisgau*
 Leipzig*
 Zschortau*

Italy

Rome*

Netherlands

Amers Foort*
 Amsterdam*

United Kingdom

Chatham*
 London*
 Manchester*

SUB-SAHARAN

AFRICA

Côte d'Ivoire

Abidjan
 Agboville
 Bingerville*
 Dabou
 Danane*
 Yamoussoukrou*

A p p e n d i x
F

Selected resource people

Eritrea
Asmara*
Dubarwa*
Keren*

Kenya
Nairobi
Naivasha
Ngong

Senegal
Dakar
Louga
Saint-Louis
Thiès

Tanzania
Arusha*
Bagamoyo
Dar es Salaam
Dodoma*
Lushoto*
Mehru*
Morogoro

Uganda
Kampala*

Zambia
Lusaka

SOUTH AMERICA

Argentina
Buenos Aires
Lomas de Zamora
San Isidro

Bolivia
El Alto*
La Paz*

Brazil
Curitiba
Rio Branco do Sul
Rio de Janeiro

Chile
Maipú
Santiago

Colombia
Bogotá
Cali*
Medellín*
Villa de Leyva*
Zipaquirá

Peru
Chosica
Lima
Villa El Salvador

**CENTRAL AMERICA
AND THE CARIBBEAN**

Haiti
Port-au-Prince*

Mexico
Coyoacan
Culhuacan
Mexico City

Nicaragua
Managua
Nagarotte

Panama
Colón
La Chorrera
Panama City

NORTH AMERICA

Canada
Ottawa*

United States
Baltimore*
Chicago*
New York*
Philadelphia*
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The individuals listed here are among the most knowledgeable experts in various aspects of urban agriculture. Many were called upon during the course of this study. The specialties of individuals who focus on a particular area of urban agriculture are shown in brackets. Where no specialty is listed, the individual is an expert in urban agriculture in his or her country of residence.

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Selected readings

The Urban Agriculture Network has assembled the world's largest library of materials on urban agriculture. The titles listed here are a cross-section of this collection.

Please note that where an edited volume or a special issue of a periodical is related to the subject of urban agriculture, individual articles within the volume or issue are not listed separately. Note also that non-English publications are not equally represented in this list.



- Aipira, Hoffman. "Urban Farming: Multi-Purpose Farming and the Politics of Urban Paradise in Southern Africa". King's Manor, York: University of York, Institute of Advanced Architectural Studies, n.d.
- Akinyeke, Isaac Olaolu, principal investigator. *Study on Street Foods in Ibadan, Nigeria*. Ibadan, Nigeria: Food and Agriculture Organization and the Department of Human Nutrition, University of Ibadan, 1987.
- Amis, Philip. "Sustainable Urban Development and Agriculture in Uganda". Birmingham, England: International Workshop on Planning for Sustainable Urban Development, Paper no. 15, 1992.
- Applehof, Mary. *Worms Eat My Garbage*. Kalamazoo, Mich.: Flower Press, 1982.
- Ashman, Linda and others. *Seeds of Change: Strategies for Food Security for the Inner City*. Los Angeles: Southern California Interfaith Hunger Coalition, 1993.
- Atkinson, Sarah J. *Food for the Cities: Urban Nutrition Policy in Developing Countries*. Busi Moloele, series ed. Department of Public Health

- and Policy. London: London School of Hygiene and Tropical Medicine, 1992.
- Ba, B. *Alimentation-Energie en Milieu Urbain Démuni à Dakar*. Paris: United Nations University, Food-Energy Nexus Programme, 1987.
- Bartone, Carl, Maria Luisa Esparaza and Carmen Mayo. *Monitoring and Maintenance of Treated Water Quality in the San Juan Lagoons Supporting Aquaculture*. Lima, Peru: CEPIS/Pan American Health Organization, 1985.
- Bernstein, Janis, Jac Smit and Annu Ratta. *Urban Agriculture: Opportunity for Sustainable Cities in Sub-Saharan Africa*. Towards Environmentally Sustainable Cities in Sub-Saharan Africa Series. Washington, D.C.: World Bank, Africa Technical Department, Environmentally Sustainable Development Division, 1996.
- Boakey, E.A. "Agriculture Development on Urban Fringes". Ghana, 1982.
- Bricas, Nicolas and others, eds. *Nourrir Les Villes en Afrique Sub-Saharienne*. Collection "Villes et Entreprises". Paris: Editions L'Harmattan, 1985.
- Brownrigg, Leslie. *Home Gardening in International Development: What the Literature Shows*. Washington, D.C.: League for International Food Education, 1985.
- Carter, Jane. "The Potential of Urban Forestry in Developing Countries: A Concept Paper". Rome: Food and Agriculture Organization, 1994.
- Cleveland, David, and Daniela Soleri. *Food from Dryland Gardens: An Ecological, Nutritional, and Social Approach to Small-Scale Household Food Production*. Tucson, Ariz.: Center for People, Food and the Environment, 1991.
- Cohen, Monique. "Street Food Trade". *Urban Examples* 14. New York: UNICEF, 1987.
- Cointreau, Sandra Johnson, and others. *Recycling from Municipal Refuse: A State of the Art Review and Annotated Bibliography*. Washington, D.C.: World Bank, 1984.
- Darmajanti, Erwina. "Research Report on Urban Agriculture". Jakarta, Indonesia. Photocopy. 1994.
- Departamento del Distrito Federal. *Rescate Ecologico de Xochimilco*. Mexico: City of Mexico, DDF, 1992.
- Diallo, S. "Urban Agriculture in West Africa: Research Review and Perspectives". Report to the International Development Research Centre, Ottawa, 1993.
- Diallo, S., and Y. Coulibaly. *Les Déchets Urbains en Milieu Démuni à Bamako*. Paris: United Nations University, Food-Energy Nexus Programme, 1987.
- Drakakis-Smith, David. "And the Cupboard Was Bare: Food Security and Food Policy for the Urban Poor". *Geographical Journal of Zimbabwe* 23 (1992): 38-58.
- Drakakis-Smith, David, and Dan Tevera. "Informal Food Retailing in Harare". Goteborg, Sweden: Department of Human and Economic Geography, School of Economics and Commercial Law, Goteborg University, 1993.
- Drescher, A.W. "Urban Agriculture in the Seasonal Tropics of Central Southern Africa—A Case Study of Lusaka, Zambia". Freiburg, Germany: Institut für Physische Geographie, 1994.
- Edwards, Peter. *Aquaculture: A Component of Low Cost Sanitation Technology*. World Bank Technical Paper 36. Washington, D.C.: World Bank, 1985.
- Edwards, P., and R.S.V. Pullin, eds. *Wastewater-Fed Aquaculture*. Proceedings of the International Seminar on Wastewater Reclamation and Reuse for Aquaculture, Calcutta, India, 6-9 December 1988. Bangkok, Thailand: Asian Institute of Technology, 1990.
- Finqueliévich, Susana. *Food and Energy in Latin America: Provisioning the Urban Poor*. Paris: United Nations University, Food-Energy Nexus Programme, 1986.
- Food and Agriculture Organization. *Street Foods*. Food and Nutrition Paper no. 46. Jogjakarta, Indonesia: Food and Agriculture Organization, 1988.
- Freeman, Donald B. *A City of Farmers: Informal Urban Agriculture in the Open Spaces of Nairobi, Kenya*. Montreal: McGill-Queen's University Press, 1991.

- Furedy, Christine, and Dhruvjayoti Ghosh. "Ecological Traditions and the Creative Use of Urban Wastes: Lessons from Calcutta". International Conference on the Ecological Aspects of Solid Waste Disposal, Hong Kong, 18-22 December 1983.
- Ganapathy, R.S. "Development of Urban Agriculture in India: Public Policy Options". Ahmedabad, India: 1983.
- Gordon, David, ed. *Green Cities: Ecologically Sound Approaches to Urban Space*. Montreal: Black Rose Books, 1990.
- Gutman, Pablo, Gabriela Gutman and Guillermo Dascal. *El Campo en la Ciudad: La producción agrícola en el Gran Buenos Aires*. Buenos Aires: Centro de Estudios Urbanos y Regionales, 1987.
- Harvard Institute for International Development. "Enterprises for the Recycling and Composting of Municipal Solid Waste in Jakarta, Indonesia". Jakarta: Center for Policy and Implementation Studies, 1992.
- Hawkins, John N. "Shanghai's Food System." Photocopy. 1981.
- Heimlich, Ralph E., ed. *Land Use Transition in Urbanizing Areas: Research and Information Needs*. Washington, D.C.: The Farm Foundation in cooperation with the USDA Economic Research Service, 1989.
- Helmore, Kristin, and Annu Ratta. "The Surprising Yields of Urban Agriculture". *Choices* 4, no. 1 (1995): 22-27.
- Honghai, Deng. "Urban Agriculture as Urban Food Supply and Environmental Protection Subsystems in China". Photocopy. 1991.
- Hoyles, Martin. *The Story of Gardening*. London: Journeyman Press, 1991.
- International Development Research Centre. *Cities Feeding People: An Examination of Urban Agriculture in East Africa*. Ottawa: International Development Research Centre, 1994.
- International Food Policy Research Institute. *Environmental Aspects of Agricultural Development*. IFPRI Policy Brief 6. Washington, D.C.: IFPRI, 1989.
- Jaeger, Dirk. "Lusaka, Garden City: The Agricultural Activities of City Residents". Draft. Amsterdam: Royal Tropical Institute, n.d.
- Jeavons, John. *How to Grow More Vegetables than You Ever Thought Possible on Less Land than You Can Imagine*. Palo Alto, Calif.: Ecology Action of the Peninsula, 1974.
- Jiménez-Osornio, Juan J., and others. *Past, Present and Future of the Chinampas*. Maya Sustainability Report 1. Riverside, Calif.: University of California, Riverside, 1990.
- Journey, Tim, Paul Skillicorn and Bill Spira. *Duckweed Aquaculture: A New Aquatic Farming System for Developing Countries*. Washington, D.C.: World Bank, 1993.
- Kasperson, Roger E., and Jeanne X. Kasperson, eds. *Water Re-Use and the Cities*. Hanover, N.H.: Clark University Press, 1977.
- Khoury, Nadim, and others. *Reuse of Wastewater in Agriculture: A Guide for Planners*. Water and Sanitation Report 6. UNDP-World Bank Water and Sanitation Program. Washington, D.C.: World Bank, 1994.
- Khouri-Dagher, Nadia. *Food and Energy in Cairo: Provisioning the Poor*. Paris: United Nations University, Food-Energy Nexus Programme, 1986.
- Kleer, Jerzy, and Agustyn Wos. *Small Scale Food Production in Polish Urban Agglomerations*. Paris: United Nations University, Food-Energy Nexus Programme, 1988.
- Kolstrup, Hendrik. "Urban Agriculture: Food Production and Land-Use Planning in Maputo: A Project Proposal". Master's thesis, School of Architecture, Department of Human Settlements, Aarhus, Denmark, 1985.
- La Rovere, Emilio Lebre. *Food & Energy in Rio de Janeiro: Provisioning the Poor*. Paris: United Nations University, Food-Energy Nexus Programme, 1985.
- Ledogar, Robert J. "Food and Survival in Lusaka's Self-help Townships". *Carnets de l'enfance* 43: 57-62.
- Lee-Smith, Diana, and others. *Urban Food Production and the Cooking Fuel Situation in Urban Kenya: National Report: Results of a 1985 National Survey*. Nairobi: Mazingira Institute, 1987.
- Lourenco-Lindell, Ilda. "Informal Food Production, Distribution and Consumption in a Peripheral District of Bissau: A Summary of a

- Master's Thesis". Stockholm: Department of Human Geography, Stockholm University, 1994.
- Lupanga, I., P.M. Msolla, Z.S. Mvena and M.K. Shoo. "Livestock and the Urban Environment in Tanzania: Some Burning Issues for Policy Makers". Arusha: Tanzania Veterinary Association, 1990.
- Manshard, Walther. "Agricultural Change: Market Gardens in West African Urban Communities—The Case of Ouagadougou (Burkina Faso)". In *Development and Ecology: Essays in Honour of Professor Mohammad Shafi*, edited by Mehdi Raza. Jaipur and New Delhi: Rawat Publications, 1992.
- Marshall, Judith, and Otto Roesch. "The 'Green Zone' Agricultural Cooperatives of Nampula City: A New Phase in the Mozambican Cooperative Movement?" *Journal of Southern African Studies* 19, no. 2 (1993): 240–72.
- Marulanda, Cesar, and Juan Izquierdo. *La Huerta Hidroponica Popular*. Santiago, Chile: Regional Office of FAO for Latin America and the Caribbean, 1993.
- Maxwell, Daniel G. *Land Access and Household Logic: Urban Farming in Kampala*. Kampala, Uganda: Makerere Institute of Social Research, 1993.
- Maxwell, Daniel, and Samuel Zziwa. *Urban Farming in Africa: The Case of Kampala, Uganda*. Nairobi, Kenya: African Centre for Technology Studies, 1992.
- McPherson, E.G., and others. *Chicago's Evolving Urban Forest: Initial Report of the Chicago Urban Forest Climate Project*. Radnor, Pa.: USDA Forest Service, Northeastern Forest Experiment Station, 1994.
- Mbiba, Beacon. "Urban Agriculture in Zimbabwe: Implications for Urban Management, Urban Economy, Urban Poverty, the Environment and Gender". Proceedings of a one-day seminar, Department of Rural and Urban Planning, University of Zimbabwe, Harare, 1993.
- . *Urban Agriculture in Zimbabwe: Implications for Urban Management and Poverty*. The Making of Modern Africa Series. Aldershot, England: Avebury, 1995.
- McPherson, E. Gregory, David J. Nowak and Rowan A. Rowntree, eds. *Chicago's Urban Forest Ecosystem: Results of the Chicago Urban Forest Climate Project*. Radnor, Pa.: USDA Forest Service, Northeastern Forest Experiment Station, 1994.
- Meier, Richard. "Ecological Planning and Design: Paths to Sustainable Communities". Draft. Berkeley, Calif.: University of California, Berkeley.
- Midmore, David, Vera Ninez and Ramesh Venkataraman. *Household Gardening Projects in Asia: Past Experience and Future Directions*. Taipei, Taiwan: Asian Vegetable Research and Development Center, 1991.
- Minerbi, Luciano, and Bruce Schliemann. "Food and Fuel and Urbanization in Asia: Comparison of Three Selected National Development Plans: Thailand, Philippines and Bangladesh". Draft. Honolulu: East-West Center, 1983.
- Ministry of Planning, South Africa. "South Africa: Investigation into the Potential Role of Urban Agriculture: Towards the Preparation of Policy Guidelines". Pretoria: Ministry of Planning, South Africa, 1991.
- Mlozi, Malongo R.S. "Development of Urban Agriculture through Unethical Agricultural Extension Services: A Case of Tanzania". Saskatoon, Saskatchewan: College of Education, University of Saskatchewan, 1992.
- . "Information and the Problems of Urban Agriculture in Tanzania: Intentions and Realizations". Ph.D. dissertation, University of British Columbia, Vancouver, Canada, 1994.
- Mosha, A.C. "Urban Farming Practices in Tanzania", *Review of Rural and Urban Planning in South and East Africa*, no. 1 (1991): 83–92.
- Mvena, Z.S.K., I.J. Lupanga and M.R.S. Mlozi. "Urban Agriculture in Tanzania: A Study of Six Towns". Draft. Morogoro, Tanzania: Sokoine University of Agriculture, Department of Agriculture, Education and Extension, 1991.
- National Academy of Sciences. *Making Aquatic Weeds Useful: Some Perspectives for Developing Countries*. Washington, D.C.: National Academy of Sciences, 1976.

