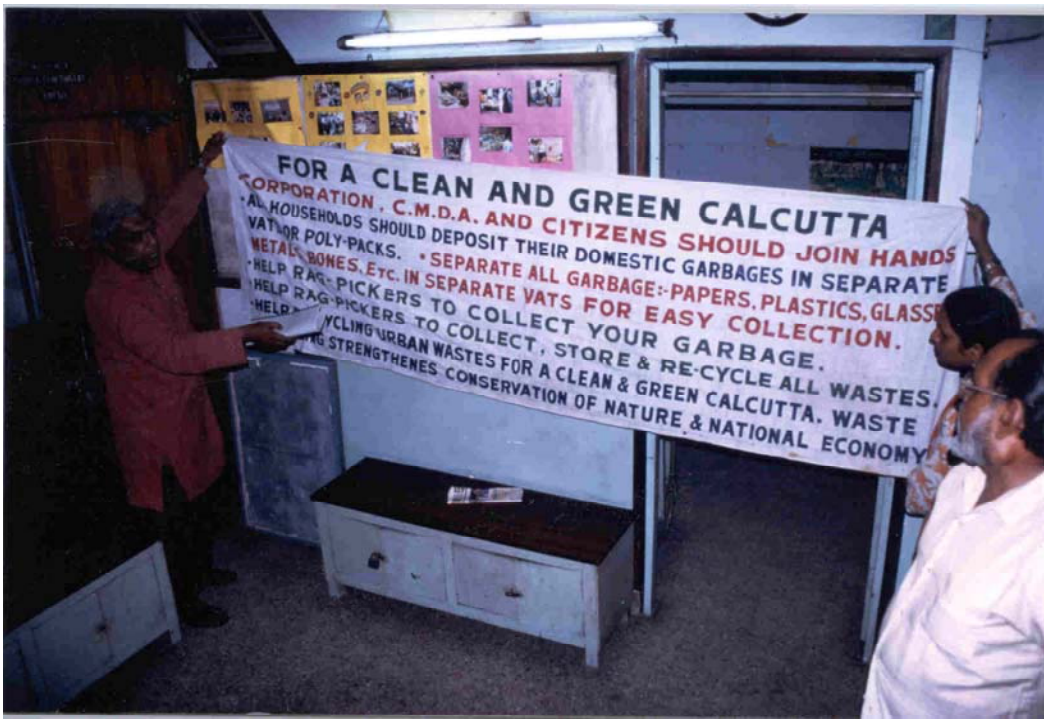
1.3 Urban Agriculture and the City Ecology



Organising for recycling of organic wastes.

(Picture: Christine Furedy)

Urban agriculture functioning in urban ecosystems

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Introduction

Urban ecology cannot be seen as one clear concept, as it can be approached from a number of fundamentally different perspectives. In normative usage, it describes urban design programmes at the political and planning level. In sciences, three concepts can be distinguished, two based on natural sciences and one approach based on social sciences. Within the natural sciences, urban ecology is used to refer to that area of biology (for the purpose of this article: natural sciences include the science of agriculture, fisheries and forestry) that is concerned with urban areas. There are two kinds of natural scientific concept in urban ecology: the study of ‘nature’ (natural species) in the city (including nature based systems such as agriculture, aquaculture and forestry) and the urban area as an ecosystem. The urban ecosystem approach proposes that the city, as with other ecosystems, shows structure and function, including biotic and abiotic components and the cycling and conversion of energy and materials. There also exists spatial organisation and change through time, which results in certain patterns of behaviour and distribution of species, populations and communities. As such, the urban ecosystem can be seen as an open system, highly dependent on other surrounding ecosystems with which there are flows, exchanges, and interactions. Social sciences also study urban ecology, putting emphasis on the interactions between humans in the urban area, also referred to as human ecology.

Many concepts are attributed to urban agriculture. First, a distinction between rural agriculture and urban agriculture has to be made. The main feature of urban agriculture that distinguishes it from rural agriculture is its integration into the urban economic and ecological system, or 'urban ecosystem'. It is not its urban location which distinguishes urban agriculture from rural agriculture, but the fact that it is embedded in and interacting with the urban ecosystem. A useful definition for urban agriculture is given by Luc Mougeot (2000): "Urban agriculture is an industry located within (intraurban) or on the fringe (periurban) of a town, a city or a metropolis, which grows or raises, processes and distributes a diversity of food and non-food products, (re-)using largely human and material resources, products and services found in and around that urban area, and in turn supplying human and material resources, products and services mainly to that urban area".

To define the opportunities, threats and possibilities of urban agriculture it is important to place urban agriculture within a certain urban development and planning context. In Rio, an overall programme has been defined as: "Human settlements shall be planned, developed and improved in a manner that takes full account of sustainable development principles and all their components, as set out in Agenda 21... We need to respect the carrying capacity of ecosystems and the preservation of opportunities for future generations...".

Using the Agenda 21 framework as a starting point, urban agriculture can best be located in the natural science context of urban ecology. Functions of urban agriculture as analysed in the natural science can be defined. However, urban agriculture can also be approached as part of a large urban ecosystem in which the impact on the sustainability of the urban ecosystem is considered.

In view of the above, this article mainly reviews the state-of-the-art literature dealing with the consequences and possibilities of urban agriculture to sustain urban areas. The bibliography is screened on research topics dealing with positive and negative aspects of urban agriculture, on city ecology and on societal conditions needed for urban agriculture.

Systematisation of references

Important impacts of urban agriculture on the city ecology indicated in the literature are the following :

Potential positive impacts of urban agriculture on the urban ecosystem

- Recycling urban organic wastes and nutrients
- Waste water management
- Reclaiming of degenerated areas
- Reduction of transport
- Reduction of energy use for urban food production
- Dust filtration by plants
- Noise reduction
- Drain trough the soil of rainwater and runoff
- Biodiversity through local differences in habitat
- Reduction in the dispersion of diseases
- (Micro-) climate improvement amelioration
    - Reduction of heat
    - Reduction of CO_2-discharge
    - Wind breaks
    - Improvement of micro-climate
- Multifunctional use of space

Potential negative impacts of urban agriculture on the urban eco system

- Destruction of vegetation
- Erosion
- Siltation
- Contamination of soils or groundwater with pesticides
- Depletion of water bodies

Conclusions

- There is a substantive body of research on urban agriculture, dealing with its incorporation into the urban ecosystem, with respect to recycling nutrients, wastewater and solid waste.
- Fewer studies have been done on the role of urban agriculture in urban climate management.
- Some studies are available which deal with polluted environments effecting food and consequently human health.
- Studies of the impact of urban agriculture on environmental components such as groundwater and soils are scarce.
- Also the benefits of urban agriculture for the urban ecosystem with respect to multiple use of space are not well researched yet.
- Often, urban ecological research is pure observation of what happens in the realm of urban vegetation, groundwater management and microclimate. Urban agriculture studies focus in particular on cases.
- Guidelines or generic models to promote urban agriculture as a component of sustainable urban ecosystems are not yet available. It is recommended that more studies should be done on how to incorporate urban agriculture in the flows of water and energy in the urban ecosystem.
- Also environmental risk assessment is an important subject to focus on.
- Macro-urban ecological studies, in which conclusions are drawn about the degree of self-reliance with respect to food and timber in relation to geographical features and regional characteristics, would help to build strategies for improving urban ecosystems towards sustainability. Unfortunately, very little has been produced on this subject.
- Within the framework of Agenda 21, an enormous task lies ahead to limit the impacts of cities on their wider environments. The knowledge collected so far on urban agriculture indicates that it is likely that further development of urban agriculture can substantially help to reduce urban ecological footprints. Given the potential role of urban agriculture for the sustainability of the urban ecosystem it would be important to formulate a specific research agenda. A key research area is to analyse scenarios and strategies with respect to the role of urban agriculture as a ‘cleaner’ as well as its role in reducing flows (of energy, water, nutrients, raw materials, and transport) from urban hinterlands to cities.

Aipira, Hoffman; Cockburn, Charles **(1994). Urban farming in low-income cities: proceedings of the first workshop on 'Urban Farming: Strategy for Food and Environmental Health in Low-Income Cities. One World Series. 26 p. ISBN 0_904761_44_4. Institute of Advanced Architectural Studies (IoAAS)**

food security and nutrition city ecology

waste recycling; food security; climate amelioration; energy; land reclamation; nutrition; garden city

This booklet contains the workshop report on the first workshop on 'Urban Farming: Strategy for Food and Environmental Health in Low-Income Cities' as well as a paper by Hoffman Aipira 'Urban farming: beyond feeding the masses'. From the notion that in many low income cities informal cultivation of crops and raising

animals are increasingly adopted as a strategy for self-reliance in food and fuelwood supply, this paper introduces the concept of urban farming. Issues, policies and practices including problems are discussed. Links with other city systems such as waste management, energy, land reclamation, are evaluated. (NB)

Bartolucci, Marisa **(ed.) (1996). The seeds of sustainability, Special Issue of Metropolis**
city ecology
urbanisation; ecology; sustainability; eco-tourism; composting

An excellent overview by several authors of the sustainable city movement inside city planning and design professions. Includes description of planned suburban agriculture outside Chicago. (JS)

Barton, Hugh **(ed.) (1998). Sustainable communities Earthscan, London**
city ecology
community; ecology; decision making

This volume, by an expert team, provides a practical direction to anyone interested in advancing communities as eco-systems. It examines the technologies of food, energy, water, and flora and fauna. Cases from UK. Denmark, Germany, Australia, New Zealand and the USA, list of current eco-villages and eco-neighborhoods by country. (JS)

BC Housing Management Commission **(1999). People, plants and homes: brings gardens to life. Urban Agriculture Notes http://www.cityfarmer.org/peopleplant.html. 5 p. Community Information and Education, BC Housing Management Commission**
Supplier: City Farmer, Canada's Office of Urban Agriculture
city ecology services
inner city gardening; housing; Canada; British Columbia

Describes the British Columbia Housing's People, Plants and Homes Program, which promotes gardening in its residential complexes. (NB)

Bellows, Anne C **(1999). Urban food, health, and the environment: the case of Upper Silesia, Poland. In: For hunger-proof cities: sustainable urban food systems / Mustafa Koc, Rod MacRae, Luc JA Mougeot and Jennifer Welsh (eds), p. 131-135. ISBN 0_88936_882_1. CAD 35.00. International Development Research Center (IDRC), PO Box 8500, Ottawa, Ontario, Canada K1G 3H9**
Supplier: International Development Research Centre (IDRC), Publications Department, PO Box 8500, Ottawa, Ontario, Canada K1G 3H9
health and environment food security and nutrition city ecology
Poland; health; ecology; access to food; crisis response; organic agriculture; education

Allotment gardening is typically conducted by women, retirees, and other reserve labour. This local production has provided a measure of shelter from the vagaries of inefficient production and food distribution (typical of centralized socialist states) and from inaccessibly high food prices, compounded by unemployment (typical of market systems). However, the yields and safety of local food labour can be reduced in severely polluted regions. The case study from Gliwice, in Upper Silesia, southwest Poland, discusses (1) organizing an acquisition, labeling, and distribution system for retailing chemically tested organic products, linking farmers to consumers; (2) distributing chemically tested produce directly to schools and hospitals and creating subsidies for their purchase; and (3) educating community groups about food contamination and the benefits of organic and farming. (Abstract adapted from original)

Brook, Robert M.; Dávila, Julio (eds) **(2000) The periurban interface: a tale of two cities. 251 + vii p. School of Agricultural and Forest Sciences, University of Wales, Bangor, UK; Development Planning Unit, University College London, UK London: DFID**

city ecology land use planning waste recycling
natural resources; periurban agriculture; GIS; Ghana;; India

A publication written in the framework of research conducted by the Natural Resource Systems Programme of the UK Department for International Development (DFID) on natural resources in the 'periurban interface'. It describes research conducted in two city-regions: Kumasi, Ghana, and Hubli-Dharwad, India. An exhaustive comparison is made between the national development of India and Ghana and between the two cities, in terms of spatial, human and economic development, but also with regard to the institutional framework under which the periurban interface has developed in recent years and to the decision-making processes that are likely to shape the future of the interface. The resources base of the two cities is examined considering cropping and livestock systems, and soil, water and waste management, and how the urbanisation process has affected these. Also, there is a chapter on comparing livelihood strategies of poor families in the two cities. Geographical Information Systems (GIS) play an important role in the research conducted by the NRS Programme and receive much attention in this publication. The strength of this tool for planning and analysis in a rapidly changing environment is clearly demonstrated, notably for the case of Kumasi. (WB)

Brouwers, Joost; Harms, Eric; Juffermans, Jan; Koetsenruijter, Willem; Perebooms, Harrie **(1998). De duurzame stad.131 p. ISBN 90_75365_11_X. De Kleine Aarde**

city ecology land use planning
urban transport; wastewater; waste recycling; sustainable building; renewable energy; green management

In 50 cases from Holland and elsewhere in Europe sustainability in urban development is discussed. Themes included are spatial use, traffic, water, climate policies, waste, sustainable building, use of solar energy and green space

management. In the last chapters exemplary municipalities and promising developments are presented. (NB)

Carter, Jane E **(1995). The potential of urban forestry in developing countries: a concept paper. Food and Agriculture Organization (FAO), Via delle Terme di Caracalla, 00100 Rome, Italy**
urban forestry city ecology
environmental aspects

The paper first defines urban forestry and next the changing role of trees in Third World cities is discussed, with reference to growing environmental concerns. The third section elaborates various locations in which trees may be cultivated after which the benefits and problems associated with urban forestry are discussed. Further key issues like socio-cultural aspects are highlighted in section five. Tree management and tree establishment issues are discussed in section 6 and institutional aspects are reviewed in section seven. The last section deals with topics requiring further investigation and information gaps in developing countries. (NB)

Centre de Documentation Tiers Monde de Paris (CDTM) **(1996). Au sud: des villes en marche. Les dossiers de presse du CDTM Thèmes & Pays no. 65 (November 1996). 88 p. 50.00 FF**
city ecology
case studies; urban livelihoods

Presents a number of background articles and case studies inspired by the Habitat II conference in Istanbul. In spite of all the misery in slums the various authors also see chances arise through ever increasing community development initiatives. (WB)

Chagnot, Isabelle **(1998). Agriculture périurbaine et paysage. Paris, France: Institut d'Aménagement et d'Urbanisme de la Région d'Ile-de-France (IAURIF), 1998. 26 p.**
city ecology
France; Paris; periurban agriculture; landscape

This short document, prepared by the principal public research institute specialized in the planning of Greater Paris, focuses on the landscape aspects of the periurban agricultural spaces of this region. It suggests proposals for “landscape management through agriculture.” (JN)

Chaplowe, Scott G **(1997). Sustainable prospects in urban agriculture. In: For all generations: making world agriculture more sustainable / J. Patrick Madden and Scott G. Chaplowe (eds), p. 70-100. World Sustainable Agriculture Association (WSAA), California Chapter, 8554 Melrose Ave., West Hollywood, California, 90069 USA**

city ecology community development
community initiatives; case studies

A chapter from this important publication treating urban agriculture. It conveniently groups together the various aspects of urban agriculture henceforth well known and well described. There are many boxes with examples of successful community initiatives. (WB)

Cleveland, David A **(1997). Are urban gardens an efficient use of resources? Arid Lands Newsletter no. 42 (fall/winter 1997). 4 p.**
economic impact city ecology
gardening; arid zones; resource management; water efficiency

Explores the functions and importance of gardens. There is an information gap with regard to productivity of gardens. This paper tries to fill some of the gaps based on monitoring the results of gardens in Tucson. Furthermore, the paper discusses ways to improve water efficiency in gardens. (NB)

Davidson, Joan **(1988). Building more resourceful cities: community-based initiatives in energy saving, recycling and greening. In: Cities and ecology / MAB Program. - Collected reports vol. 2 p. 172-175. Division of Ecological Sciences, UNESCO, 7 Place de Fontenoy, 75700 Paris, France**
community development R&D methodology city ecology
resource conservation; environmental management; United Kingdom

Concentrates on community involvement in urban environmental management in the UK and examines various aspects of environmental management namely energy conservation, waste recycling and greening the city. (WB)

Deelstra, Tjeerd et al **(1989). The resourceful city: management approaches to efficient cities fit to live in. Royal Netherlands Academy of Arts & Sciences, Den Hague 63 p**.
city ecology
urbanisation; ecology; UNESCO; biosphere; health

This is essentially a conference report written by six experts. It defines the problems faced by the need for a sustainable and livable city in the 21st century. (JS)

Deelstra, Tjeerd; Nijwening, Stefan **(1997). Environmental sustainability of cities: management issues and experiences in developing countries. 65 p. International Institute for the Urban Environment, Nickersteeg 5, 2611 EK, Delft, Netherlands; SNV Netherlands Development Organisation, Bezuidenhoutseweg 161, 2594 AG, Den Haag, Netherlands**
city ecology

environmental management; urban development

Purpose of this paper is to give an overview of the many and diverse environmental and human issues related to urban development. At the beginning, the authors give some indicators about present-day urbanisation. Cities are usually seen as a potential threat to the environment due to their unsustainability. Still, they are also places that hold great promise for becoming more sustainable. Examples of ecological footprints of different cities are presented. The paper looks at all issues affecting one city, from land use and tenure rights to waste disposal, transport, street lighting and pollution. A chapter is dedicated to institutional constraints being one of the most important impediments for sustainable city development. Different approaches, strategies and methods for urban development are given, most of them supported with real life examples from different countries. The paper ends with a list of proposed further reading and useful addresses. (WB)

Deelstra, Tjeerd; Girardet, Herbert **(2000). Urban agriculture and sustainable cities. In: Growing cities, growing food: urban agriculture on the policy agenda, p. 43-65. DSE, GTZ, CTA, SIDA**

city ecology

sustainable development; urban planning; urban policies; ecological footprint; microclimate; soil conservation; waste recycling; nutrient cycling; water management; biodiversity

The article explores the possibilities to create a sustainable world and city from an ecological perspective. It is argued that today urban dwellers don't really live in a civilisation but in a mobilisation (of natural resources people and products). The challenge is to create loops and closes cycles. The contribution potential and constraints of urban agriculture to this are discussed. (NB)

Departamento del Distrito Federal **(19??) Documentos sobre la problemática agraria en el Distrito Federal. Mexico City, Mexico: Comision Coordinadora Para el Desarrollo Agropecuario del Distrito Federal. 153 p.**

city ecology

Mexico; agricultural policies; communal land; open space planning; access to land

This document, published by the Federal District's commission for agricultural development, combines three separate reports. The first and especially the third report deal with the *ejido* (communal land holdings) and their impact on land access by urban farmers of Mexico City. The second report focuses on the plan for the Ajusco region, which has been set by the national government as a major natural reserve to the south of the city. (JN)

Departamento del Distrito Federal **(1992). Rescate Ecológico de Xochimilco. Mexico: City of Mexico, DDF. 57 p.**

city ecology

Mexico; Chinampas; ecology; restoration

This document reviews the plan, approved in November 1989 by the Mexican president, for the “ecological rescue” of Xochimilco, the exceptional aqua-terra cultivation district in southern Mexico City. The plan considers ecological, hydrological, infrastructural, archeological, agricultural and other dimensions. (JN)

Dimanlig, Horacio C **(et al.) (1979). Urban agriculture: an approach to landscaping for marginal settlements. 36 p. United Nations Environment Programme (UNEP) , National Housing Authority (NHA)**

land use planning city ecology

Philippines; settlement areas; urban planning; urban landscaping; urban vegetation; planting materials

A landscaping manual dealing with physical aspects of the housing landscape in the Philippine setting and with applying urban agriculture or, more generally, introducing vegetation into the urban environment, 'the soft landscape'. There is a detailed descriptive list of suitable plant materials for this purpose. (WB)

Donadieu, Pierre **(1998). Campagnes urbaines. École Nationale Supérieure Du Paysage. Arles: France, Actes Sud. 219 p.**

land use planning city ecology

France; periurban agriculture; landscape; leisure; neighbours; multifunctionality; urban planning

This book on “urban countryside” addresses the central question: rather than to seek to no avail to control the growth of the city through webs of belts, barriers and green spaces, why not construct the urban fabric *with* agricultural and forested spaces? It therefore proposes that periurban agriculture could be considered by metropolitan planners as a planning tool that is capable of organizing sustainably the territory of cities. Widely illustrated with color photos and examples from across France, the book (by the co-director of the Urban Agriculture Program at the *Ecole Nationale Supérieure du Paysage* in Versailles) is exemplary of contemporary French literature on urban agriculture, particularly appropriate more developed countries. (adapted from original by JN)

Easton, Charlene **(1993) Local Initiatives: ICLEI members in action, 1991-1992. ICLEI, Toronto; 38 case studies. On: www.ICLEI.org.**

community development city ecology

forestry; wastes; ecology; sustainable development; environmental health; land use management; natural resource conservation

This report is 38 case studies of cities coping with environmental issues. It is the first in a series. Substantial data, how to and who information is included. (JS)

Ellis, Frank; Sumberg, James **(1998). Food production, urban areas and policy responses. In: World Development vol. 26 (1998) no. 2 p. 213-225**

rural-urban linkages food security and nutrition city ecology

Africa; rural-urban linkages; food policy

A literature review focusing especially on food production in and around sub-Saharan cities and towns. The authors emphasise the importance of rural-urban interactions in resource management and output markets. At the same time, they warn against too high expectations about the role of urban agriculture for food security of urban dwellers. (WB)

Esrey, Steve and Andersson, I. **(2001) Ecological Sanitation - Closing the Loop. In: *Urban Agriculture Magazine*, no 3, Health , March 2001, RUAF, Leusden The Netherlands.**

health and environment waste recycling city ecology

sanitation

Today, half of humanity does not have access to any type of sanitation. This is a fundamental denial of human dignity and threatens human well-being. The rest of humanity relies on conventional approaches to sanitation, which fall into one of two categories: waterborne systems and pit latrines. Both “flush and discharge” and “drop and store” technologies were built on the premise that the nutrients we excrete have little value, and the waste is suitable only for disposal. Consequently, the environment is polluted, nutrients are lost, and a wide array of health problems result. The authors argue that a different approach is needed to both sanitation and agriculture. The approaches are non-polluting, rely on biological processes, recycle nutrients, and can be safe and effective in promoting health and nutritional well-being. Ecological sanitation is given here as a representation of that shift in the way people think about and act upon human excreta.

European Foundation for the Improvement of Living and Working Conditions **(1993). Innovations for the improvement of the urban environment: a European overview. 556 p. ISBN 92_826_6302_7. ECU 56.00. European Foundation for the Improvement of Living and Working Conditions, Loughlinstown House, Shankill, Co. Dublin, Ireland**
Supplier: Office for Official Publications of the European Communities, 1993

R&D methodology city ecology

development projects; case studies; sustainable development; networking

Provides an overview of some 90 urban innovative projects aiming at increased sustainability. The report examines cases from the 12 member states (in 1993) and in an additional band also gives cases from Austria, Sweden and Finland, countries that joined the European Union in 1995. Projects are listed per country. There is a wide range of themes, unfortunately not grouped together in a subject index. The report is concluded with a list of resource persons. (WB)

Fleury, André; Gonthier, Michel; Hamel, Jean-Maurice **(1998). Actes de la rencontre franco-québécoise: points de vue sur l'agriculture périurbaine contemporaine. Quebec: n.p., 1998. 36 p.**

land use planning city ecology

France; Quebec; periurban agriculture; farmland preservation; regional planning; landscape

This is a conference report on a meeting in October 1998 between planners, professors and students from France and the Quebec region of Canada, part of an ongoing cooperation between French and Quebecois universities on this topic. Participating students from one country all undertook internships in the other country and report on them here. It focuses on issues that regard the periurban areas surrounding cities, and how these parts of metropolitan areas can be planned for. It includes issues of land management, agrotourism, and multifunctional agriculture. (JN)

Foeken, Dick; Mwangi, Alice Mboganie **(1998). Farming in the city of Nairobi. ASC Working Paper no. 30/1998. 49 p. African Studies Centre, PO Box 9555, 2500 RB Leiden, The Netherlands**

city ecology land use planning

food security; nutrition; food policy; land use systems; health; economic impact; land tenure; urban policies; reuse of waste; poverty; Kenya; land use policies; agricultural production; land use policies; urban livestock; wastewater reuse

Urban farming can be seen everywhere in Nairobi, especially in informal densely populated residential areas, which do not exist on official maps. Three types of urban farming are distinguished: farming in backyards, farming in open spaces and farming in former rural areas surrounded by city expansion. The second type of farming is usually practised by the urban poor and there is ample open space in the city boundaries. A description is provided on the scale of urban farming, the urban farmers and the farming practises. Next the importance of urban farming and the constraints urban farmers face are presented. Lastly the prospects of urban farming are discussed, which include environmental and policy aspects and development efforts. To further develop urban farming the first step to be taken by the Nairobi authorities is to admit that the slum dwellers are a fact of life in the city, that policies directed at improving the living situation of the poor are needed and that urban agriculture should be part of such policies.

Forster, Tobias Edmund **(1999). The role of the living landscape as an element of sustainability in Asian cities during the 21st century. Urban Agriculture Notes http://www.cityfarmer.org/Asiancities.html. 8 p. Able Charity, Team 73 Hong Kong, Hong Kong, SAR, China**
Supplier: City Farmer, Canada's Office of Urban Agriculture

city ecology

urban planning; Asia; environment; urban forestry; landscape

Provides an understanding of sustainable city development by outlining the concepts of urban agriculture and urban forestry listing the benefits and describing examples. Subsequently, the framework of an Asian city as a living ecosystem is illustrated. The paper describes how the concept of the living landscape can be integrated with the theories and practices of sustainability to produce living cities. (NB)

Frick, Francis **(1999). A seaside arcology for Southern China. Urban Agriculture Notes http://www.cityfarmer.org/frick.html. 12 p.**
Department of Architecture, University of Hong Kong
Supplier: City Farmer, Canada's Office of Urban Agriculture
city ecology
urban planning; architecture; ecology; urban design; environment; wastewater; bioremediation; renewable hydrogen systems; China; Hong Kong

Architectural ecology, or arcology, is a way to physical design intervention associated with a temporary, localised decrease in entropy within a defined context. The paper highlights its role in urban agriculture and waste water bioremediation. Rapidly emerging problems in China's southern coastal urban areas already provide a need and a context to realise the arcology "seed" design as described. Arcology's significance will probably increase as ecological/resource problems intensify. Hong Kong is presented as a positive "green" influence for green technology and advanced design services implied by arcology. (NB) (Abstract adapted from original)

Garnett, Tara **(1996). Growing food in cities: a report to highlight and promote the benefits of urban agriculture in the UK. 90 p. ISBN 1_900_670_56_9. National Food Alliance / SAFE Alliance, 5-11 Worship street, London EC1A 2BH, UK**
food security and nutrition city ecology
community development; economic development; vegetable production; horticulture; United Kingdom;

In the UK, many poor urban neighbourhoods have become food retailing deserts, where access to good food shops and markets is rare. Parts of the countryside too are becoming desertified economically with farming employing just over 2% of the population. The author pleads for people to reconnect to the land and their culture by growing food, following a long tradition of allotment gardening in the UK, and also with the 'Dig for Victory' campaign during the 2nd World War in mind. This report presents and analyses a wide variety of case studies classified by aspect: community development, economic development, education, environment, health, leisure, and sustainable neighbourhoods. There is a useful resource section with addresses in the UK. A number of recommendations are formulated with regard to policy integration; funding, support and promotion; and land and water. (WB)

Garnett, Tara **(1996). Farming the city: the potential of urban agriculture. In: The Ecologist vol. 26 no. 6 p. 299-307**

city ecology horticulture
home gardening; allotment gardens; political aspects; United Kingdom

Describes urban agriculture in Great Britain, primarily allotment gardens, of which there are around half a million in Britain nowadays. In spite of the fact they are thriving, with long waiting lists, allotment gardens are under heavy threat from urban development schemes. There is a highly interesting description of the rise of the allotment movement in Britain, as a result of political considerations. (WB)

Gbadegesin, Adeniyi **(1991). Farming in the urban environment of a developing nation: a case study from Ibadan metropolis in Nigeria. In: The Environmentalist vol. 11 no. 2 (1991) p. 105-111**
horticulture city ecology
Nigeria; Ibadan; surveys; food security; urban poor

Reports on a survey among 800 part-time or full-time farmers in the urban fringe of Ibadan. Results showed well-known considerations such as reducing people's expenses on food and supplementing the family's income. Major threat was reported to be competition from non-agricultural land uses. The article describes characteristics of the urban farming system in Ibadan, in which the proportion of crops grown for staple is high. Interestingly, roughly half of all those who had been approached to sell their land, had turned down this offer (though the article does not give information about prices offered). (WB)

Garnett, Tara **(2000). Urban agriculture in London: rethinking our food economy. In: Growing cities, growing food: urban agriculture on the policy agenda, p. 477-500. DSE, GTZ, CTA, SIDA**
services food security and nutrition city ecology
food policy; nutrition; community development; land use systems; health; ecology; economic impact; gender; urban policies; reuse of waste; poverty; land tenure; food systems; United Kingdom; food deserts; education

Starting with the ecological footprint of London the London foot system is analysed. Increasing alienation of Londoners from agriculture and the emergence of food deserts are raised as issues. Despite a small contribution in quantities produced a wide range of farming activities occur in London (allotment gardens, private gardens, county farms, parks etc). From this perspective the potential and actual contribution of urban agriculture towards health, the environment, household economies, education and training and community development are discussed. Factors affecting urban agriculture and the perspectives for urban agriculture are presented in which it is argued that sustainable food growing is a metaphor for social change, catalysing new ways of thinking about our society, our economic system and our environment. It is argued that there are plenty of opportunities in the multiple and flexible forms of urban agriculture. (NB)

Gertel, Jörg; Samir, Said **(2000). Cairo: urban agriculture and visions for a 'modern' city. In: Growing cities, growing food: urban agriculture on the policy agenda, p. 209-234. DSE, GTZ, CTA, SIDA**

city ecology Urban livestock land use planning

urban livestock; food security; food policy; asset strategy; health; ecology; economic impact; gender; urban policies; reuse of waste; poverty; Egypt

Forms of urban agriculture in Cairo are related to its extremely high population pressure and the government policy, especially with regards to food subsidies. Green open space is scarce. Small-scale animal husbandry, such as chicken raising, is interesting as it provides for expensive proteins and can be practised in confined areas. In certain cases organic waste is used as cheap fodder to feed the animals. Most people engaging in urban agriculture are poor and production is mainly for subsistence purposes. A second element is that animals are important assets. The image of food produced in Cairo is not very positive and there are indications of health risks associated with urban farming. Scientist and authorities consider urban agriculture an oxymoron as they associate urban with modern and agriculture with rural and backward. It is believed that urban farming tarnishes the image of Cairo with negative implications for the modernisation of Cairo. Nevertheless to a section of the urban poor small-scale animal husbandry is of critical importance and is an important strategy to cope with food security in Cairo. (NB)

Giles, José **(1997). Agriculture in green belts of urban centers. In: Agriculture + Rural Development no. 2/97 p. 58-60**

city ecology

food security; crisis response; green belts; periurban agriculture; urban planning; Mozambique

Makes a case for developing green belts around urban centres in order to enhance food security, especially in times of crisis. However, this is not enough as appropriate modern technologies need to be used to improve efficiency. Examples are discussed from Mozambique, Peru and China. It is argued that careful planning on green belt production now can avoid disasters later. (NB)

Girardet, Herbert **(1992). The Gaia atlas of cities: new directions for sustainable urban living. ISBN 1 85675 065 5**
Supplier: Gaia Books Limited, 66 Charlotte Street, London W1P 1LR, United Kingdom

city ecology

ecology; sustainable development; urban history; rural-urban linkages; food systems; land use systems; waste recycling; health; urban planning; poverty

The book is a source book of innovative ideas and strategies for making cities ecologically sustainable aiming to generate discussion of new ways of living and contains over 80 small case studies. The book starts if with an analysis of urban ecology and discusses the concept of urban metabolism. The discussion is put into a

historic context of developments. The second part of the book argues what has gone wrong in urban development and presents a diagnosis on many aspects of the diseased city. Ways of how to heal the city towards a more sustainable place to live are presented in the third part and new directions for sustainable urban living are summarised. (NB)

Girardet, Herbert **(1999). Growing food in cities: assessing the potential of a long-standing tradition. In: Gate: Technology and Development no. 2 (April-June 1999) p. 4-9**
city ecology land use planning
economic aspects; natural resource management; recycling

Looks at some of the origins of urban agriculture and examines its present potential with examples from past and present. Urban agriculture has a long history as an important source of food for the masses. The article asserts the importance of creating a circular urban metabolism. (NB)

Gordon, David **(ed.) (1990). Green cities: ecologically sound approaches to urban space. Montreal and New York: Black Rose Books, 1990. 299 p.**
city ecology
ecology; land use; environmental problems; selfreliance; resources

With visions of an ecological urban model, with some green technologies now in place that could implement this model, and with an emerging view of a social organization supportive localized “green” decisions, this work suggests that the green city is a real and emerging prospect. In the first part, six leading thinkers seek to define what a green city is. The second part presents a series of articles that analyze how cities can be “naturalized”. The papers in the final part then describe how this change can be effected and obstacles overcome. While many of the articles here deal with cities more broadly, several are explicitly on urban agriculture. (adapted from original by JN)

Graham, Elizabeth **(1999). Farming the built environment. In: For hunger-proof cities: sustainable urban food systems / Mustafa Koc, Rod MacRae, Luc JA Mougeot and Jennifer Welsh (eds), p. 150-154. ISBN 0_88936_882_1. CAD 35.00. International Development Research Center (IDRC), PO Box 8500, Ottawa, Ontario, Canada K1G 3H9**
Supplier: International Development Research Centre (IDRC), Publications Department, PO Box 8500, Ottawa, Ontario, Canada K1G 3H9
city ecology
architecture; food production; urban planning; soil fertility

New interest is being generated in cities as sites for food production. In this context, people are focusing on what the soils in and around urban centres can produce. The fertility of urban soils and their relationship to the built environment must be viewed

as a dynamic regime in which building breakdown, drainage patterns, burials, industrial debris, garbage dumping, and human and animal waste disposal are acknowledged and analysed. This article introduces the idea that urban decay and the destructive processes of cities can be harnessed productively. An argument is made that archaeology can play a role in planning for sustainable cities as it can provide guidelines for highly effective recycling, not only of organic waste, but also of the built environment itself. (Abstract adapted from original)

Hamm, Bernd; Muttagi, Pandurang K **(eds) 1998. Sustainable development and the future of cities. 290 p. ISBN 1_85339_452_1. GBP 14.95**
Supplier: Intermediate Technology Publications (ITP), 103-105 Southampton Row, London WC1B 4HH, UK
city ecology
urban development; environmental degradation; pollution; urban environment

Based on the outcomes of four International Summer Seminars on Sustainable Development and the Future of Cities held between 1991 and 1994 at the Bauhaus Dessau, Germany, this collection of papers examines urban sustainability. An increasingly urban world can also be a world in where the ideas of sustainable development are put into practice. The issue is how to turn these centres of major pollution into ecologically, economically and socially sustainable environments. The underlying book looks primarily at social issues as central to understanding how sustainability can be achieved in cities. In the first part, a conceptual framework for assessment is provided. Part two presents case studies having a regional perspective, in Southeast Asia, North America and Eastern Europe. Part three descends to the local level with cases analysed from Iran, Poland, Canada and Finland. A number of methodologies is described here, such as Environmental Impact Assessment, Life Cycle Assessment, Eco-logistics and Material Flux Analysis. Of interest to urban planners, but also to a scientific audience interested in the Agenda 21 debates and not shied off by the rather strenuous access of the material, otherwise very relevant (WB)

Harahi, Gamez Rodriguez **(1999). Agriculture in the Metropolitan Park of Havana, Cuba. In: For hunger-proof cities: sustainable urban food systems / Mustafa Koc, Rod MacRae, Luc JA Mougeot and Jennifer Welsh (eds), p. 84-89. ISBN 0_88936_882_1. CAD 35.00. International Development Research Center (IDRC), PO Box 8500, Ottawa, Ontario, Canada K1G 3H9**
Supplier: International Development Research Centre (IDRC), Publications Department, PO Box 8500, Ottawa, Ontario, Canada K1G 3H9
city ecology land use planning
integrated urban development; ecology; deforestation; waste management; Havana; social impacts

This paper outlines the fundamental mission, objectives, goals, and strategic planning of the Metropolitan Park of Havana (PMH, an urban, social, and ecological project being developed around the final 7 km of the Almendares River, the most

important river of the Cuban capital. The PMH is committed to integrating development, environmental recovery, education, and participation. The PMH will retain a dense urban network of industries, military entities, and population centres that today occupy the territory. As an ecological park, the PMH will provide a solution to the problems of deforestation in the zone, the uncontrolled social and industrial waste, and the general lack of care for the region that threatens the area's flora and fauna and the River itself. As a social project, the PMH will provide a space for a population of nearly 9 000 inhabitants, who will be an integral part of the development planning of the park. (NB) (Abstract adapted from original)

Hardoy, Jorge E; Mitlin, Diana; Satterthwaite, David **(1992). Environmental problems in Third World cities. London: Earthscan Publications, 1992. 302 p.**
city ecology
environmental problems; ecology; health problems; sustainable development; urban impacts; political context; pollution

This authoritative book describes the environmental problems of cities in the Third World and how they affect human health, local ecosystems and global cycles. It analyzes the causes of the problems and reveals their political roots. A number of the issues are of direct relevance to urban agriculture: from water pollution and hazardous wastes, to an in-depth discussion of sustainability. The authors show that practical solutions to many of the problems can be found. (adapted from original by JN)

Helka-Liisa, Hentilä **(et al.) (1996). Innovations for the improvement of the urban environment: Austria - Finland – Sweden. 340 p. ISBN 92_827_9014_2. ECU 36,50. European Foundation for the Improvement of Living and Working Conditions, Loughlinstown House, Shankill, Co. Dublin, Ireland**
Supplier: Office for Official Publications of the European Communities
R&D methodology city ecology
development projects; case studies; sustainable development; networking

Provides an overview of some 90 urban innovative projects aiming at increased sustainability. The report examines cases from the 12 member states (in 1993) and in an additional band also gives cases from Austria, Sweden and Finland, countries that joined the European Union in 1995. Projects are listed per country. There is a wide range of themes, unfortunately not grouped together in a subject index. The report is concluded with a list of resource persons. (WB)

Hietkamp, Fern **(1995). Opportunities and constraints for urban agriculture in Bandung, Indonesia. AURN working paper no. 7. 36 p. Asian Urban Research Network (AURN), Centre for Human Settlements, School of Community and Regional Planning, The University of British Colombia, Vancouver, Canada**
land use planning city ecology economic impact
Bandung; Indonesia; urban planning; land resources; resource management

Focuses on the competition for space between urban agriculture and other activities in Bandung, Indonesia. When the author states that with the current rate of development, much of the land now used for food production within the urban area will disappear in the next 15-20 years, we must realise that this statement was made before the economic crisis hit Indonesia. The author's suggestion that city administrators should include urban farming more systematically in urban planning remains as valid as before, however. (WB)

Hough, Michael **(1995). Cities and natural process. Routledge, London, 326 p.**

city ecology

environment; energy; urban design; landscape; planning; climate; policy; urban nature

This book is a discussion of the basic conflict of the perception of nature and the practice of urban design. It suggests a framework for integrating the precepts of city and countryside. Chapter five is on City Farming.

Instituto de Desarollo Urbano Ciudad **(1994). Proyecto 'Programa Integral de Medio Ambiente y Salud', comunidad urbana autogestionaria de Huaycan, 1996-1998. Instituto de Desarollo Urbano Ciudad, Lima, Peru**

city ecology

Peru; urban planning; development projects

Project proposals for integrated urban development in Huaycan to be supported by SNV (Netherlands development assistance organisation). The proposals include the establishment of adequate planning and management mechanisms, the introduction of urban agriculture, the improvement of access to sanitary services and the establishment of urban management methods. (NB)

International Institute for the Urban Environment (IIUE) **1996. Sustainable urban development in the Third World: proceedings of a seminar held in Utrecht, September 12, 1996. 27 p. International Institute for the Urban Environment (IIUE), Nickersteeg 5, 2611 EK Delft, Netherlands; Nijmegen Urban Health Group (NUHG), Nijmegen, Netherlands; WASTE Advisers on Urban Environment and Development, Gouda, Netherlands**

city ecology waste recycling

urban development; Habitat 2; sustainability indicators; integrated waste management

In the wake of the Habitat II Conference in Istanbul, this seminar dealt with urban livelihood issues in developing countries. A good diagnostic approach to urban development is no easy undertaking in the light of its multidisciplinary character. During the seminar were addressed: indicators for urban sustainability, the integrated relationship between health, environment, culture and political development, and the role of different actors in integrated waste management. (WB)

Kaldjian, Paul **(1997). Istanbul: opportunities in urban agriculture. In: Arid Lands Newsletter no. 42 (fall/winter 1997). 10 p.**
city ecology food security and nutrition
food systems; Istanbul; Turkey; food production; resource management; food security

Provides an overview of the Istanbul food system resource use and agricultural production. The paper makes an attempt to identify the potential role of urban agriculture within the urban food system with regard to resource use, land tenure, social relations and political ecology. (NB)

Katzir, Raanan**. Agroecological aspects of the periurban process. Urban agriculture notes: http://www.cityfarm.org/israel.html - israel**
city ecology rural-urban linkages
periurban agriculture; agroecology

Looks at the consequences of urbanisation from an agroecological point of view, covering aspects like water, soil, city waste, and industrial residues. In addition, the paper looks at implications of periurban farming, such as production of special crops, exporting, agrotourism and handicraft work. (WB)

Kuchelmeister, Guido **(1989). Hedges for Resource-Poor Land Users in Developing Countries. Eschborn, Germany: GTZ. 256 p.**
urban forestry city ecology
hedges; resources; crop selection; crop management

This is a thorough evaluation (including technical assessment) of the use of hedges in developing coutnries. While not specifically focused on urban areas, the document emphasizes the use of hedges where land availability is constrained. (JN)

Lebre La Rovere, Emilio **(1985). Food and energy in Rio de Janeiro: provisioning the poor. UNU Paris. 59 p.**
city ecology food security and nutrition
market gardens; marketing; farmers' associations; smallholder food production

This report looks at experiments in a large city in the face of energy and food shortages. It detail the cooperation of an electrical utility and small-scale periurban farmers and the formation of a marketing cooperative by small-scale urban farmers. (JS)

Lee, M**. Farming logic in Kampala**
city ecology

Uganda; farming

Based on an interview with Daniel Maxwell the article describes the situation with regard to urban farming in Kampala, where a 30% of the residents engages in urban agriculture. The four main logics for farming: food self sufficiency, commercial production, food security and survival. (NB)

Lee-Smith, Diana; Lamba, Davinder **(1998) Good governance and urban development in Nairobi. 40 p.. Mazingira Institute, Nairobi, Kenya**
city ecology

This booklet, which is a study for the background report of the World Report on the Urban Future 21, gives a good historical overview and description of the development of Nairobi and its governance. It puts the situation of agriculture in its wider context of urban planning and policy making, forcing urban agriculturists to look at the institutional structure and governance of the city and perhaps understand the problems planners might face. In a comprehensive way, it shows that food security of the poorest is increasingly threatened by urban development, but that the poor might also be under threat by the encouragement of urban agriculture by city planners. (RvV)

Losada, Hermenegildo **(et al.). Urban agriculture and livestock in the City of Mexico: an option for a sustainable future. Urban Agriculture Notes http://www.cityfarmer.org/mexico.html. Animal Production Systems Area, Department of Biology of Reproduction, Division of Biological and Health Sciences, Universidad Autónoma Metropolitana, Iztapalapa, Mexico Supplier: City Farmer, Canada's Office of Urban Agriculture**
urban livestock city ecology
Mexico; livestock; crop production; reuse of waste; environment; family production

Presents research findings on urban agriculture of a team of the Autonomous Metropolitan University at Iztapalapa in Mexico. Three forms are distinguished and within these forms, animal production and arable production are discussed as well as the different perceptions of producers and authorities towards the phenomenon of urban agricultural production. Characteristics common to all three types are the use of recycled materials and the involvement of all family members in the activities. (NB)

Lugo, Ariel E **(1991). Cities in the sustainable development of tropical landscapes. In: Nature and Resources vol. 27 no. 2 (1991) p. 27-35**
city ecology
ecosystems analysis; modelling; sustainable development; overexploitation

Describes the processes involved in sustainable development, provides a socio-economic perspective, and discusses ecological engineering and economics. It also suggests ten steps to lead to better accommodation of cities in tropical landscapes.

A publication with a strong focus on modelling of ecosystems. (WB - from original abstract)

Mapatano, S. **(2002) Urban Agriculture in Kivu: How Roots Help Population With Low Income in African Great Lakes Cities . 26 th International Horticultural Conference, Toronto, August 11-17, 2002.**

city ecology

Africa (Central);Congo, DCR (Zaire); urban agriculture

Built in 1900, the town of Bukavu is located in the province of South Kivu, in the East of Democratic Republic of Congo. At the start, it counted about 10,000 inhabitants. For the moment, its population is estimated to be more or less 600,000 inhabitants. From the 1980ís, former open spaces, outlying areas and lower lands of the town started being exploited to fill in the food deficit in families and palliate the lack of salary payment and the fall of the purchasing power. The advent of the two successive wars in DRC since 1996, left insecurity pockets in rural areas which used to provide food to urban ones : more than 80 per cent of households with low income get part of their food from agricultural activities in town and in its periphery and more than 75 per cent of the crops sowed are races (roots) and tubers, essentially cassava and sweet potatoes, completed by seasonal sowing of beans. For all these crops, leaves and roots are highly consumed. Women are particularly active in that sector (more than 86 per cent) Unfortunately, farming practices are likely to favour the degradation of the urban environment if no urgent measure is foreseen. That is why thanks to close collaboration with the WFP office in Bukavu, we have undertaken a number of activities which aim at helping cultivators increase their productive capacity (of those crops) on small spaces. The feebleness of spaces available to each household and the high number of family dependants (average of 9 persons per family) justifies the preference given to races (roots) and tubers, of which tuber leaves harvest is often spread over a long period in a year.

Today, our efforts aim at :

- facilitating partnership relation between farmers and other social actors ;

- enlightening farmers on the decisions of the administrative authority in terms of protection of the environment and the management of waste ;

- Popularising farming techniques in a participative approach ;

- Valorising plants with multiple properties in urban gardens ;

- Developing a network gathering actors of the Eastern Congo towns as well as those in similar context in the neighbouring countries (Rwanda and Uganda).

Mbaye, Alain **(et al.) (1999). Some more urban agriculture case studies: Dakar, Cairo, Zambia and Cagayan de Oro. In: Gate: Technology and Development no. 2 (April-June 1999) p. 40-47**

food security and nutrition economic impact city ecology

food security; ecology; economic impact; nutrition; land use planning; political aspects

Discusses case studies on urban agriculture in Dakar, Cairo, Lusaka, and Cagayan

de Oro (Philippines). An overview is presented including what are the main agricultural activities, who is involved, what are the environmental and economic impacts and policy implications. Extended versions of the case studies can be found in 'Growing Cities, Growing Food: Urban Agriculture on the Policy Agenda' published by DSE-ZEL. (NB)

Munkstrup, Nina; Lindberg, Jakob **(1996). Urban ecology guide. 144 p. ISBN 87-87487-993 Danish Town Planning Institute, Copenhagen, Denmark**
city ecology community development
Denmark; development projects; urban planning

45 examples of projects in the greater Copenhagen district are presented in this guide together with different descriptions of urban ecology relations in the city. Very useful information can be found on the projects (ideas, purpose, time frame) as well as contacts for anybody inspired to work on a similar type of project. Projects vary from new residential developments, urban renewal and renovation to nature in the city and green centres. All of projects have in common the aim towards promoting and ensuring sustainable development. The report contains many photos from different project sites and maps of the locations. A very useful guide that can stimulate new ideas. (WB)

Muster, Gisa **(1998). Environmental problems of urban agriculture: a case study of Dar es Salaam, Tanzania. 58 p. Urban Vegetable Promotion Project (UVPP), PO Box 31311, Dar es Salaam, Tanzania**
Supplier: Ministry of Agriculture and Co-operatives (MoA&C) and Deutsche Gesellschaft fuer Technische Zusammenarbeit (GTZ).
city ecology horticulture R&D methodology
Tanzania; open space management; off-plot cultivation; vegetable production

Shows the interaction between the urban environment of Dar es Salaam and agricultural production in open spaces, examining environmental effects in particular. In addition, the role played by urban agriculture in the city's economy is examined. A methodology is presented to estimate the environmental impact of vegetable production on the city's environment. (WB)

Nasr, Joe; Kaldjian, Paul **(1997). Agriculture in Middle Eastern cities: commonalities and contrasts. Arid Lands Newsletter no. 42 (fall/winter 1997), also on http://ag.arizona.edu/OALS/ALN/aln42/nasr.html. 10 p.**
city ecology
Middle East

Urban agriculture in the Middle East has received relatively little attention thus far. Yet, the long history of urbanisation in Islamic countries has exerted a strong influence on the development of agriculture in cities, also in the light of the fragility of agricultural lands in this region with its arid or semi-arid climate. The underlying

paper sums up a number of particularities of urban agriculture in this region while identifying existing differences between countries in the region. (WB)

Nasr, Joe. and Smit, Jac. **(2000) Urban Agriculture and Urban Patterns: Implications for Sustainability. In: H. Hoffmann, K. Mathey (eds.). Urban Agriculture and Horticulture, the linkage with Urban Planning. 2000. International Symposium. Berlin July 2000. (on cd-rom)**

land use planning city ecology
urban patterns; architecture; history

Urban agriculture has emerged as an activity over the course of the past decade, gaining recognition as a contribution to the sustainability of urban settlements on multiple grounds: health improvement, community-building, environmental enhancement, etc. The presence of this activity is now becoming visible in widely different settings: from devastated inner cities to the periurban fringe, from frigid Russian cities to towns that ring the Equator, from community gardens in the richest countries to cultivation on landfills of the poorest countries. This paper seek sto tackle the question: what are the impacts of the variety in such settings on the existence and type of urban agriculture? In other words, how do different urban patterns influence how and where urban residents farm? Different ways of classifying urban form are assessed for their consequences on potential and actual urban agricultural practices, and a typology of urban patterns is developed and cross-linked to types of urban agriculture.

National Institute of Urban Affairs **(2000) The role of urban and periurban agriculture in metropolitan city management in the developing countries: a case study of Delhi**

Research Study Series No. 74. Rs. 250; US$20. New Delhi: NIUA

city ecology land use planning
environment; management; Delhi; policy

This study developed from earlier collaboration under the British DFID project on policy implications of air pollution on urban and periurban areas in developing countries. Its main concern is the contribution of urban agriculture to the national capital area of Delhi in India. After a general discussion of urban agriculture, there is a review of the policy orientation and planning provisions of the Government of India that impinge on urban agricultural practices. The case study of Delhi is described as a 'cursory review.' It gives a considerable amount of information about Delhi from official sources, and the characteristics of the periurban area or rural-urban fringe. The study tries to understand the concept and characteristics of urban agriculture, it reviews the policies that might influence such developments, studies the importance given to urban agriculture in both city development and urban environmental management and estimates its potential role in sustainable urban development. Among the conclusions: urban agriculture is important but there is no clear responsibility for these varied activities in the capital area, and planning does not yet address the issue from the standpoint of the urban poor. (Abstract by Christine

Furedy)

Nederlandse Ontwikkelingsorganisatie (SNV) **(1998). Uitdagingen voor het stedelijk milieu. 38 p. Nederlandse Ontwikkelingsorganisatie (SNV), Bezuidenhoutseweg 161, 2594 AG The Hague, The Netherlands**

city ecology waste recycling

urban environment; urban planning; waste management

Contains papers presented during a series of study meetings organised by Dutch development organisations in 1997-98. Papers deal with the various aspects of urban environment, notably waste management, urban agriculture and the role of NGOs in urban planning. In Dutch. (WB)

Newcombe, K **(1977). Nutrient flow in a major urban settlement: Hong Kong In: Human Ecology vol.5 (19077)no. 3 p. 179-208. Human Ecology Group, Centre for Resource and Environmental Studies, Australian National University, Canberra, Australia**

city ecology waste recycling

Australia; ecosystems; China; Hong Kong; nutrient balance; nutrient cycling; nutrient transport; phosphorus; recycling; urban environment

The flow of minerals is examined including current and potential nutrient recycling patterns. The flow of mineral phosphorus in the Hong Kong food system is examined in detail. A comparison is made between the land based forage area demand of the population of Hong Kong and the similar population of Sydney, Australia. It is estimated that the average Hong Kong person has a diet which requires only half of the land area needed for a Sydney inhabitant. However, Hong Kong relies on the ocean for 25% of its protein intake whereas a Sydney inhabitant only for 2.5%. Patterns of food production and nutrient recycling are proposed, with the aim of optimising resource utilisation. (NB - adapted from original abstract)

Newland K **(1980). City limits: emerging constraints on urban growth. Worldwatch Paper 38. Washington, D.C.: Worldwatch Institute**

city ecology

urban growth; urban development; sustainable development

This paper examines the rising trend in urbanization and the phenomenon of the city that must import its food from distant sources. The author notes that three conditions distinguish the growth of cities today from those of the past. One is the expanded population base that forms the backdrop to urbanization, particularly in the Third World; the second is the unfolding of an era of severe resource constraint, as evident in the “skyrocketing” price of oil; and the third is the prevalence of capital-intensive technology, which has severed the link between increased production and expanded employment. The last explains the rise of informal sector employment in the cities. The author advocates building industrialization from the ground up by

investing first in agriculture, and concludes that if rural incomes achieve parity with urban ones, the element of economic coercion in rural-to-urban migration will be largely removed. (HC, IDRC)

Nitsch, Egbert; Aue, Christina **(199?). Bedeutung staedtischer Land- und Gartenwirtschaft in Einer Welt: Gaerten als Beitrag zur Welternaehrung und zur Oekologisierung der Staedte. 33 p.**

horticulture food security and nutrition city ecology

food security; urban poor; urban policies

Examines the role and position of urban agriculture in the light of food security for the urban poor. A number of policy measures are presented that are necessary to reach a wider impact. The authors argue that this role is not restricted to cities in developing countries but plays an important role in greening cities in industrialised countries as well. (WB)

Payne, Steven **(19??). Pursuing urban harmony. In: Simply Living p. 28-30**

city ecology community development

urban design; urban planning; ecological systems; community initiatives

Paints a picture of ecologically oriented urban planning schemes, and what community initiatives can achieve within the often strict boundaries of city administration. There is particular attention for the Village Homes housing development scheme near Davis, California, with its large communal areas and food producing greenbelts, as an example of successful, functional and holistic urban design. In addition, cases are described of community initiatives in Australia. (WB)

Pearce, Barry **(1995). Urban eco-auditing and local authorities in Europe. The sustainable city: a European tetralogy no. 1. 142 p. ISBN 92_827_4917_7. ECU 15.00. European Foundation for the Improvement of Living and Working Conditions, Loughlinstown House, Shankill, Co. Dublin, Ireland**
Supplier: Office for Official Publications of the European Communities, Luxemburg

city ecology R&D methodology

environmental impact assessment; environmental auditing; case studies; Europe; sustainable urban development; Sweden; Spain; United Kingdom

Environmental auditing, or eco-auditing, examines formal and rigorous procedures for reviewing and evaluating a municipality's environmental performance. 'Municipality', in this context, refers to either the local authority organisation or to the community on behalf of which it works. Apart from checking on environmental performance it also critically examines the information used to make the assessment. Environmental auditing is either internal or external looking. In the former, it examines and evaluates the authority's current policies, plans, practices and structures, and in the latter, it reviews and describes the state of the local

environment in the municipality's locality. This report looks at a number of initiatives of European local authorities with environmental auditing, following what has already been going on in the private sector. Three case studies are reviewed in particular: Sundsvall (Sweden), Igualada (Spain), and Kirklees (UK). Among tools presented here, we mention environmental balance sheets containing the accounts of stocks and flows of environmental resources. Links between urban eco-auditing and the economics of the sustainable city receive particular attention. The main issue here is the potential tension that exists between environmental protection and economic development. This report looks at attempts there have been to link or integrate environmental auditing with an economic analysis of policies, plans and projects. Specifically, the report looks at whether economic initiatives are being audited in terms of their environmental impacts and whether an economic appraisal of environmental initiatives is being included in the auditing process. The report concludes that environmental auditing requires much commitment across the municipality, in terms of human resources and finance made available. Some clues are given on how to reduce cost involved. Data collection and interpretation has revealed itself often to be difficult. There is a danger that too much emphasis is placed on procedures and structures for making decisions rather than on securing actual improvements to the environment. Environmental auditing may play an important role in strengthening self-control mechanisms for environmental protection and in creating more environmental awareness. (WB)

Pearce, Barry **(1995). Towards an economic evaluation of urban innovative projects: micro projects for mega change. 75 p. ISBN 92-828-1104-2. ECU 20.00. European Foundation for the Improvement of Living and Working Conditions, Loughlinstown House, Shankill, Co. Dublin, Ireland**
Supplier: Office for Official Publications of the European Communities, Luxembourg

city ecology economic impact R&D methodology
sustainable cities; sustainable development; urban planning; European Union; innovations; project evaluation

Report of an overview of 110 projects on innovative urban projects in EU member states. There are interesting and relevant appendices presenting a checklist on evaluation criteria on urban sustainability and an evaluation matrix. (WB)

Peter, Conradi **(1994). Braziliaanse stad pakt milieuproblemen origineel aan: Curitiba is een laboratorium voor stedelijke problemen. In: (source unknown) (November 1994) p. 34-35. 2 p.**

city ecology
Brazil; urban planning; urban transport; environmental policy; urban wastes

Describes solutions Curitiba, in the Brazilian state of Paraná, has found to cope with urban transport, and with handling city waste. A success story. (WB)

Petts, J.. **(2000) Creating edible buildings –growing food on and around buildings. In: H. Hoffmann, K. Mathey (eds.). Urban Agriculture and Horticulture, the linkage with Urban Planning. 2000. International Symposium. Berlin July 2000. (on cd-rom).**

land use planning city ecology

United Kingdom; architecture; footprint

The world cannot accommodate an increasingly urbanised society, which continuously draws resources from evermore distant parts and uses the biosphere, oceans, land and atmosphere as a waste sink. We must therefore seek more sustainable ways in which to live and develop solutions to the current economic and ecological crisis. The background to the programme 'edible buildings' is that many parts of the world growing food on and around buildings is an economic necessity. Some city farmers attach long, narrow planters or boxes to their walls and grow cucumber and melon up the walls, supported with sticks or twine. Herbs are grown on rooftops in Santiago, silkworms on balconies in Old Delhi, pigeons in downtown Cairo, rabbits in Mexico City shanties and vegetables in Haiti. In London, at least half of its 2.8 million households have gardens –comprising nearly 20% of the total area of Greater London. 1950s research indicates that 14% of the garden area in London was allocated to fruit and vegetable production but it is likely that the current percentage is lower than this.

Postel, Sandra **(1989). Water for agriculture: facing the limits. WorldWatch, Washington DC; 54 p.**

city ecology wastewater reuse

irrigation; sewage; urbanisation

This policy paper researches the global eminent shortage of water for much of the population. It suggests several means of more efficient use including urban agriculture. (JS)

Potutan, Gerald E; Schnitzler, Wilfried H; Arnado, JM; Janubas, LG; Holmer, Robert J **(2000). Urban agriculture in Cagayan de Oro: a favourable response of city government and NGOs. In: Growing cities, growing food: urban agriculture on the policy agenda, p. 413-428. DSE, GTZ, CTA, SIDA**

city ecology horticulture food security and nutrition

vegetable production; land use systems; health; ecology; economic impact; gender; urban policies; reuse of waste; land tenure; nutrition; NGOs; school gardens; home gardening; Philippines

Cagayan de Oro is a boomtown in Mindanao. A considerable number of farmers work in the periurban area mainly in vegetable production. Within town about 40% of the households engages in backyard farming and the majority of schools maintain nurseries. Vegetables are considered 'poor man's food'. Farmers consume more vegetables than wealthier people and farming contributes considerably to in-kind family income. There are initiatives to produce and improve composting of urban organic material. As powers became more decentralised, a City Agriculture Office

was established. Awareness on urban agriculture is increasing. This all helps to promote urban agricultural initiatives. Legislation has been passed to secure agricultural land. Activities at local level are backed by a sustained flow of information through the media and by successful co-operation of NGOs and local government. (NB)

Rauber, Paul **(1999). Food for thought: cultivating our cities. On: http://www.sierraclub.org/sierra/199705/fdforthought.html. 2 p.**
city ecology food security and nutrition
home gardening; food security; urban livelihoods

Argues that cities are returning to producing their own food and gives examples of what is already being achieved by urban agriculture inside as well as outside of the USA. (NB)

RCD Consultants **(1990). Urban Agriculture in Latin America, Africa and Asia. Washington, DC: UNDP/IBRD**
city ecology economic impact
Latin America; Africa; Asia; surveys; survival strategies; history; development programmes

This document was based on the principal investigator's 15 years of part-time research and experience with urban agriculture in Asia, Africa, the Middle East and the United States, plus visits to 17 developing countries. Although urban agriculture varied more than expected from country to country, the author notes that it increases as the economy gets worse; it is strongly influenced by urban management policies and practice, especially antagonistic ones; it has no comprehensive support programs similar to those for rural farmers; and is perceived as rural, old-fashioned, temporary and low-yielding. The last indicates that the principle barriers preventing urban agriculture from achieving its potential are cultural. This report examines the various kinds of urban agriculture; the history of and trends in urban agriculture; the places where urban agriculture is carried out; the various actors involved; and the economic, social, equity and environmental impacts of urban agriculture. It also looks at technology and assistance programs for urban agriculture, and identifies a number of areas for further action. (HC, IDRC)

Richard, Matthew J **(1991). Opportunity and conflict in the periurban area of Gaborone, Botswana. 19 p. Department of Anthropology, State University of New York, Binghampton, USA**
land use planning city ecology
Gaborone; Botswana; land use rights; land tenure; resource use

Examines potential conflicts in access to and use of scarce land resources by the various stakeholders in the periurban area of Gaborone, Botswana, one of the fastest growing urban centres in the world. Most of the conflicts have to do with the

transition from communal land to freehold land tenure. This leads to fundamental changes in land use. The role of Land Boards and traditional authorities in manipulating and interpreting local land rights is unclear. (WB)

Richards, Melanie **(1990). Large African cities: a study of green open spaces. SS no. 89-00021. (source unknown)**
city ecology
green spaces; parks; urban environment; environmental aspects

Documents the importance of green open spaces (parks, agricultural areas, vacant lots and other leftover spaces) in urban areas both for environmental, social and economic (in case of growing food) functions. Environmental benefits resulting from these green open spaces are discussed at some length. The paper analyses the difficulty of park maintenance for municipalities in developing countries given the cost involved in maintaining these mostly unproductive spaces. (WB)

Sanyal, Biswapriya **(1986). Urban cultivation in East Africa. UNU Paris, 75 p.**
horticulture urban livestock city ecology
home gardening; surveys; urban livestock; urban forestry; urban management; geography

This is a groundbreaking report, predecessor to a doctoral dissertation defining the role of agriculture in East African cities, focus on Lusaka. It has an economic slant with excellent micro-geography. (JS)

Satterthwaite, David **(ed.) (1999). The Earthscan reader in sustainable cities. 478 p. ISBN 1_85383_601_X (pbk). GBP 16.95**
Supplier: Earthscan Publications, 120 Pentonville Road, London N1 9JN, UK
city ecology
urban planning; sustainable development; health; waste management

An introduction to the field of sustainable cities (part I) which brings together a wide range of published articles covering the key issues. In addition, concepts linking sustainable development and cities (part II) as well as sectoral programmes contributing to sustainable development in cities (part III) are discussed. The section on sectoral programmes includes chapters on urban agriculture and planning green cities, waste recycling and building and designing with nature. Part IV contains case studies on innovative action plans (Local Agenda 21) at city level from South and North America and information systems and urban sustainability indicators. The last part (V) places sustainable city development in a wider regional and global context. The contributing authors are well known experts and scientist in the fields of urban development, urban and community planning, urban agriculture, environmental studies etc. (NB)

Sawio, Camillus J **(1994). Urban agriculture and the sustainable Dar es Salaam Project**
Cities Feeding People Series report no. 10. 19 p. International Development Research Center (IDRC), PO Box 8500, Ottawa, Ontario, Canada K1G 3H9
city ecology land use planning
Tanzania; urban planning; environmental aspects; land use planning; development projects

Outlines the scope of urban agriculture and then draws a picture of the situation in Dar es Salaam and a number of other cities in Tanzania, with regard to urban agriculture. The core of this publication is about the Sustainable Dar es Salaam project (SDP) established under the auspices of the Global Sustainable Cities Programme of the United Nations Centre for Human Settlements (UNCHS). Priorities set for this project had to do with management of open spaces, recreational areas, hazard lands, greenbelts and urban agriculture potential, all approached in an integrated manner. The paper presents an (impressive) constitutional framework for this project. A table is provided on the surfaces occupied by the various open spaces in Dar, from which the rise of urban agriculture plots becomes apparent. The increase in surface under residential area, however, is even more impressive. Tanzanian authorities adopt, generally speaking, a fairly positive attitude towards urban farmers (with the possible exception of animal husbandry), as opposed to what has been reported from numerous other countries. (WB)

Siegle, L. **(2001), Green Living in the Urban Jungle. Supplier: Green Books, Foxhole, dartington, Totnes, Devon TQ9 6EB, UK**
city ecology
organic agriculture; United Kingdom, Europe (Western)

Embracing an eco-friendly lifestyle can be a daunting prospect for your average urban dweller. After all, our synthetic surroundings are miles away from inspiring pastoral scenes, and the temptation to indulge in a spot of mindless consumerism lurks around every corner. To exacerbate matters, we are generally pressed for space, probably cash and definitely time. But the good news is that this handbook is here to address these issues head on, dispel the myths and provide some vaible solutions. Chapters including Absolute Beginners, Go Wild with Food, Eco-Chic Comes to Town and Green Scene provide green and organic options for a dynamic urban existence. They explore everything from severing the cord to your local supermarket, looking at some other more exciting shopping options, thinking creatively about recycling and transport, to enjoying a green night out. The City Focus sections keep motivation high by honing in on some successful projects in UK cities, from Cardiff to Leeds. And, in the spirit of learning by someone else's trials and errors, excerpts from the author's diary reveal the real thrills and spills of altering your lifestyle. The end results show that even the most outrageous twonie can discover their green roots with the minimum of disruption. Better still is the news that old habits don't die hard, expecially when replaced with the benefits of new and improved green ones.

Smit, Jac **(2000) Urban Agriculture and Biodiversity. In: Urban Agriculture**

Magazine, no 1, Maiden Issue, July 2000, RUAF, Leusden The Netherlands.
city ecology
biodiversity

Jac Smit of TUAN (The Urban Agriculture Network, based in the USA) argues that bringing back agriculture, forestry, aquaculture and livestock rearing to the human settlement is a key component in reducing the negative ecological footprint of cities that is 50 to 125 times the area of the city itself. He illustrates this with a number of interesting examples.

Smit, Jac; Ratta, Annu; Bernstein, Janis **(1996). Urban agriculture: an opportunity for environmentally sustainable development in sub-Saharan Africa. Towards Environmentally Sustainable Development in Sub-Saharan Africa Paper No. 11. Washington, DC: The World Bank, African Technical Department (AFTES). 33 p.**
city ecology
Africa; sustainable development; urbanisation; credit

The purpose of this report is to examine how urban agricultural activities can contribute to sustainable development in Sub-Saharan Africa (SSA) and how the World Bank can expand its involvement in UA in the future. Chapter 1 defines UA, discusses the nature and extent of UA worldwide, and summarizes UA's role in sustainable development. Subsequent chapters examine urbanization trends in SSA and the nature and extent of urban agricultural activities in SSA (chapter 2), key factors that constrain UA in Africa's urban and periurban areas (chapter 3), how the World Bank has addressed UA (chapter 4), and the various means by which the World Bank can promote or support UA (chapter 5). (adapted from original by JN)

Smit, Jac **(1999). What would the world be like in the 21st century if cities were nutritionally self-reliant: the prospect for urban agriculture. Urban Agriculture Notes. http://www.cityfarmer.org/21century98.html. 5 p. The Urban Agriculture Network, 1711 Lamont St. NW, Washington, DC 20010, USA**
Supplier: City Farmer, Canada's Office of Urban Agriculture
economic impact city ecology
waste management; urban policies; environment

Summarises findings from the book "Urban agriculture: food, jobs and sustainable cities" and outlines prospects for the 21st century on the basis of questions emerging form the book: what if waste is food and sewage and garbage were prime inputs to food production? What if urban landscape were edible, what if vacant land in cities were productive, what if urban areas were increasing rather than diminishing biodiversity? The author argues that the characteristics of the 21st century city with more productive land use, with fertile soil contributing to increased biodiversity and a major shift to healthy and greener cities are already there. However we haven't noticed it and too often policies and investment have been hindering its emergence. (NB)

Sorensen, Mark **(1997). Good practices for urban greening. Washington, D.C.: Inter-American Development Bank, Social Programs and Sustainable Development Department, Environment Division. 84 p.**
city ecology urban forestry
ecology; urban planning; land tenure; gender; legislation; financing; Latin America

This report was prepared in two drafts, preceding and following a conference in Mexico City, with participants from 23 countries. It is divided into five parts: (i) problems of rapid urban growth, (ii) the benefits of urban greening (particularly social), (iii) the challenges to establishing a greening program, (iv) the requirements of such a program, and (v) the elements of a greening program (including urban agriculture and finance). It includes a useful directory of projects. It is one of the more comprehensive brief reports on urban forestry and agro-forestry. (JS)

South African Department of Environment Affairs **(1994). Urban open spaces: potential for productive utilisation." Conference, Theunis Bester Hall, Technikon, Pretoria, 1994.**
city ecology
South Africa; vacant lands; municipal lands; urban management

These are the unpublished conference proceedings for a meeting focused on the reuse of underused or vacant urban land for farming purposes. It contains 21 papers (in English or Afrikaans) plus a number of other abstracts. (JN)

Spiaggi, E.P. **(2000) Urban Agriculture and Local Sustainable Development in Rosario Argentina. In: H. Hoffmann, K. Mathey (eds.). Urban Agriculture and Horticulture, the linkage with Urban Planning. 2000. International Symposium. Berlin, July 2000. (on cd-rom).**
land use planning city ecology waste recycling
Argentina; Rosario; vermiculture; education

Experiences are given of an project, in a poor neighbourhood (Empalme Graneros) of Rosario city, Argentina on urban agriculture, in operation since 1996. 40 families are participating of the project. In 1998 support came from de Organisation of American States (OAS), and the project collaborated with institutions from Chile Centro de Educación y Tecnología (CET), and Canada Environmental Policy Institute (EPI). One of the aims was to compare the state of UA in those countries.

Spooner, Brian **(1986). MAB urban & human ecology digest. UNESCO, 137 p. Contains list of 746 projects in 32 countries**
city ecology
ecology; urbanisation; Papua New Guinea

This is a fifteen-year summary of UNESCO's Man and the Biosphere Programe. It

expands on the concept of the city as an organism that consumes resources, has its own metabolism, and excretes waste. A major objective of the MAB programme was to show how energy was used in cities, following the systems ecology analysis of energy budgets and nutrient cycles. This digest, presenting 47 projects in 32 countries, is representative of MAB but a full exploration requires reference to the MAB Information System (Blue) Series. One of the studies best related to urban food production is from Papua New Guinea's Lae and its hinterland, reported in five documents. (JS)

Stanhill, G **(1977). An urban agro-ecosystem: the example of nineteenth-century Paris. In: Agro-Ecosystems no. 3 (1977) p. 269-284. Institute of Soils and Water, The Volcani Center, ARO, Bet Dagan, Israel**

city ecology horticulture waste recycling

France; Paris; ecological systems; waste recycling; horses; manures

One hundred years ago a sixth of the area of Paris was used to produce annually more than 100,000 tons of high-value, out-of-season, salad crops, grown on very heavily manured 'hotbeds', partly under glass or protected from the winter cold by straw mats. The cropping system was sustained by the use of approximately one million tons of stable manure produced each year by the horses who provided the power for the city's transport area. This article gives a very detailed, quantitative account of this unique farming system, with a wealth of figures demonstrating its extent and importance. In the first quarter of the 20th century, the system declined rapidly, as a consequence of the replacement of the horse by the motor car, competition for land within the city, and competition from areas with a more favourable climate outside the city, facilitated by improvements in the transport system. A fascinating description of an outstanding system that once was known to the English-reading world under the name of 'French gardening'. (WB)

Stevenson, Christopher **(1996). Market production of fruits and vegetables in the periurban area of Dar es Salaam, Tanzania. Dar es Salaam, Tanzania: GTZ, Urban Vegetable Promotion Project. 40 p.**

horticulture economic impact

Tanzania; fruits; vegetables; market gardening; periurban agriculture

This report is one of the publications to come out of the Urban Vegetable Promotion Project (UVPP) of Tanzania. This study surveys the characteristics of urban horticultural farmers and their activities in Dar. It includes consideration of spatial and marketing characteristics. (JN)

Streiffeler, Friedhelm **(1993). General principles and approaches for sustainable urban greenbelts with special reference to Africa. Unpublished. 59 p.**

city ecology

Africa; green belts; organisation; ecology

This paper is a thoughtful assessment of some key issues and challenges for urban agriculture in Africa. The results of the literature on urban agriculture in Africa in general, and Kisangani, Congo, and Nairobi, Kenya, in particular, are discussed under the following headings: why urban agriculture — the growth of urban centres in Africa, the social situation of large parts of the urban population and the role of women; where urban agriculture — household gardens, urban and periurban agriculture, and the issue of land access; the practice of urban agriculture — what is produced, frequent problems encountered (especially decline in soil fertility and plant diseases), and agricultural techniques; ecological aspects — ecological advantages of urban agriculture, environmental problems associated with urban agriculture and some attempted solutions, including wastewater and solid waste recycling; commercial urban agriculture; the problem of organization — cooperation (or lack of) among urban farmers and the role of municipal administrations; and felt needs in information and extension. It is noted that urban farming is predominantly a subsistence activity, subject to very little experimentation due to the tight margin of manoeuver within which the urban farmer operates and the lack of a supporting network. Suggestions for practical action focus on resolving the issue of access to land and security of tenure, and developing ways of recycling wastewater for irrigation and household wastes for plant nutrition. The author calls for further research into farming systems, farmer organization, recycling, and analysis and evaluation of urban agriculture projects. (HC, IDRC)

Swedish International Development Cooperation Authority (SIDA) **(1995) Towards an urban world: urbanisation and development assistance. 80 p. ISBN 91_586_7227_3. Swedish International Development Cooperation Authority (SIDA), Stockholm, Sweden**

city ecology

urbanisation; Sweden; development co-operation

Urbanisation constitutes a major transformation of society with far-reaching economic and social consequences. The paper argues that Sweden should increase its international development assistance to urban areas as well as analyse the links between rural and urban areas. Suggestions on how this could be done best and what should be taken into account are given. (NB)

Tha Hla, Patima **(1999). Bangkok gardens: how does your garden grow? Urban Agriculture Notes http://www.cityfarmer.org/Thaigardens8.html. 3 p. Supplier: City Farmer, Canada's Office of Urban Agriculture**

horticulture city ecology

Thailand; Bangkok; vegetable production; home gardening

The article is a report of a seminar on how to grow vegetables in urban areas, more specifically in Bangkok, and what are problems encountered. (NB)

Thrupp, Lori A **(ed.) (1998). Cultivating diversity: agrobiodiversity and food security. World Resources Institute. 64 p.**
city ecology food security and nutrition
biodiversity; policy; integrated pest management; organic agriculture; stakeholders

The argument is made that biodiversity is a fundamental factor for agricultural production, food security and ecological stability on planet Earth. Further the case is made that agricultural growth and biodiversity are not always conflicting goals. Evidence is presented to show the multiple benefits of integrating biodiversity into agriculture for both small and large-scale farming. Agricultural biodiversity is presented as lying within the general framework of sustainable human development and settlements. Recommendations include: (i) support sustainable ecological agriculture, (ii) develop and ecosystems approach, (iii) empower farmers and communities to protect their right to resources, (iv) adapt agricultural practices and land use to local agroecological conditions, (v) conserve and regenerate plant and animal genetic resources, (vi) adopt policies and establish institutional changes that support agro-biodiversity and (vii) uphold both the convention on biological diversity and the mandates of the World Food Summit. (JS)

Tjallingii, Sybrand P **(1995). Ecopolis: strategies for ecologically sound urban development. Dorschkamprapport. ISBN 90_73348_34_X. Instituut voor Bos- en Natuuronderzoek**
Supplier: Backhuys Publishers, PO Box 321, 2300 AH Leiden, The Netherlands
city ecology R&D methodology
urban development; ecological development; urban planning; Netherlands

Resulting from ESUD, for Ecologically Sound Urban Development, a Dutch study project looking into the problems of the environment and urban development. Aim of the project is to form a planning strategy, to indicate steps which can be taken at the local level and to draw up priorities for research, design and policy. A number of models together shaping the Ecopolis, are described in this publication: for chains, areas and organisations. Examples cited are from The Netherlands. (WB)

Todd, Nancy Jack; Todd, John **(1994). From eco-cities to living machines: principles of ecological design. 195 p. ISBN 1-55643-150-3**
Supplier: Eco-logic books, 19 Maple Grove, Bath BA2 3AF, UK
city ecology wastewater reuse
urban design; permaculture; waste recycling; urban planning

For more than thirty years, John and Nancy Todd have been advocating a new, provocative approach to urban design. The underlying book was originally published in 1984, at a time when environmental problems began to appear in their full size. The authors describe site-specific technological interventions and systems-wide ecological thinking developed in the framework of the New Alchemy Institute on Cape Cod. The book is centred around two concepts: Eco-cities, or designs for integrating agriculture and flowing pure water into green urban settings; and Living

Machines, a family of technologies for purifying wastewaters without chemicals. This is a far-reaching publication destined for a broad audience. (WB)

Torres Lima, Pablo A; Rodríguez Sánchez, Luis Manuel; Garcia Uriza, Brenda I **(2000). Mexico City: the integration of urban agriculture to contain urban sprawl. In: Growing cities, growing food: urban agriculture on the policy agenda, p. 363-390. DSE, GTZ, CTA, SIDA**

city ecology economic impact community development
urbanisation; land use systems; farming systems; ecology; economic impact; gender; urban policies; Mexico; reuse of waste; poverty; land tenure; ornamental plants; floriculture; fodder production; migration; water management; community organisation

Three different zones for urban agriculture are distinguished in Mexico: the urban nuclear zone, rural-urban fringe and the intermediate urban zone. The land tenure situation and conceptualisation of land as a commodity are important for the urbanisation process and the types of urban agriculture. Some characteristics of urban farming are that it is flexible, small scale, sells at local markets and recycles waste. Functions go beyond strict economic impact and include cultural aspects. Farmers are a mixed group of people of migrant origin with women playing a dominant role in urban agriculture. An important aspect of urban farms is that they do not have a minimum size and enable large sections of the population to benefit. The farms use space very efficiently. The contribution to the household economy varies, but is significant. Urban agriculture also generates numerous jobs. Urban agriculture functions as a green belt, limiting outward migration of the urban poor and the urban sprawl. Analysis of flows of mass and energy demonstrate the efficient reuse of outputs of urban agriculture. Agriculture in the urban zone is illegal and in general government policies have not been favourable to agriculture. Visions and strategies for urban agriculture are presented as well as recommendations of which decentralising political and economic power perhaps is the most important. (NB)

Trans Rural Initiatives **(1996). Agriculture et forêt périurbaines sortent de l'ombre. Special issue, supplement to No. 75 (1996). 24 p.**

city ecology urban forestry land use planning
France; periurban agriculture; policy

This supplement to a French periodical contains several syntheses of actions on the preservation of urban (particularly periurban) agriculture in France. These range from agricultural policies of small towns such as Aubagne to the key principles of Paris' "Green Plan". (JN)

Tricaud, Pierre-Marie; Blancher, Philippe **(1993). Espaces naturels dans une métropole indienne: Ahmedabad. 2 Volumes. Ministère des Affaires Étrangères, Direction du Développement et de la Coopération Scientifique,**

Technique et Éducative, Paris, France; 13+30 p.
city ecology land use planning
urban greening; forestry; food security; home gardening; community gardens; livestock; India; policy; geography

This is one of a series of studies of the un-built urban metropolitan space in Africa, the Middle East, North America and Europe. It places the Ahmedabad metropolis in history (to 1411), in India and in the urban world. It details specific communities, farming areas, and methods of production. Its policy analysis and view of potentials is particularly useful. (JS)

Tricaud, Pierre-Marie **(1996) Ville et nature dans les agglomérations d'Afrique et d'Asie. Collection Etudes et Travaux. Ministère des Affaires Etrangères and Ministère de la Coopération. Paris: Editions du Gret. 103 p.**
city ecology
Africa; Asia; nature; classification; land use policies

This report was prepared by one of the only researchers to have studied the phenomenon of urban agriculture from the 1980s through today, and to have done so in several continents. He develops here a typology of “natural urban spaces” (including agricultural ones), using a range of illustrations. After describing the roles and meanings of these spaces, he examines the city-nature dynamic. These observations lead to recommendations for a general policy for the creation and management of urban natural spaces, which should contribute to an increased sense of responsibility among the stakeholders. (adapted from original by JN)

Urban Resource Systems **(1984). Global urban agriculture: an annotated bibliography. San Francisco: Urban Resource Systems**
city ecology
bibliographies

This bibliography, prepared under a grant from the International Development Research Centre (IDRC), contains about 230 references to books and articles on indoor, outdoor, community, organic, tropical, intensive, container, hydroponic, space-saving and other kinds of gardening, as well as on composting, waste re-utilization, controlling pests, heavy metals, implications for public policy, etc. The literature is international in scope. Most of it is in English, but there are references to a few items in French and Spanish. (HC, IDRC)

Wackernagel, Mathis; Lewan, Lillemor; Borgstroem-Hansson, Carina **(1999). Evaluating the use of natural capital with the ecological footprint: applications in Sweden and subregions. In: Ambio vol. 28 (1999) no. 7 p. 604-612 Supplier: Royal Swedish Academy of Sciences**
R&D methodology city ecology
ecological footprint; footprint calculations; Sweden; economic impact assessment

The ecological footprint assesses people's use of natural resources by comparing their resource consumption and waste production to the regenerative capacity of the earth. Previous studies based on United Nations statistics have shown that humanity's use of natural capital exceeds the global biocapacity. They have also shown a great spread in the size of people's ecological footprints. In this study which focuses on Sweden, the method of footprint and biocapacity calculations is improved and it is demonstrated how a national footprint can be used for regions and even catchment areas. The method is compared to those used earlier and possibilities and limitations are discussed. (WB - from original abstract)

Wade, Isabel Mary **(1981). Fertile cities. In: Development Forum (September 1981) p. 7**
city ecology
urban ecosystems

General overview article stressing the need to develop urban ecosystems to provide food and fuel for the cities. (WB)

Webber, Tammy **(1999). Green roofs cool city rooftop gardens in Chicago to fight smog, heat. Urban Agriculture Notes http://www.cityfarmer.org/greenroofs.html. 2 p.**
Supplier: City Farmer, Canada's Office of Urban Agriculture
city ecology horticulture
United States; rooftop gardening; city microclimate

Discusses the potential and developments of rooftop gardening for Chicago to fight smog and improve the city's microclimate. (NB)

Werna, Edmundo; Harpham, Trudy; Blue, Ilona; Goldstein, Greg **(1998). Healthy city projects in developing countries: an international approach to local problems. 148 p. ISBN 1_85383_455_6 (pbk). GBP 15.95**
Supplier: Earthscan Publications, 120 Pentonville Road, London N1 9JN, UK
health and environment city ecology
health care; primary health care; project development; urban development; health; urban management; urban policies; urban poor; pollution; poverty

Analyses the current state of Healthy City Projects in developing countries. This approach has been implemented by the World Health Organization (WHO) in the wake of the Ottawa Charter (1985) in which a holistic approach to public health care was developed based on the idea that living and environmental conditions are responsible for health. This is particularly acute in cities where so many people live and work together in close proximity. Originally established in 11 European cities, then spreading throughout Europe and then also in other regions of the world, the project is now active in at least 1,000 cities or towns. Core concepts in the Healthy City programme are: (1) Better health will come, not so much from curative care but

from improved living conditions; (2) People must take the initiative to improve their own health and their own environments; (3) Health should be seen as an essential part of overall development within the community. A Healthy City project supports city health authorities and/or local government in the field of information and analysis, in particular monitoring of health status and analysis of requirements. In addition, support in policy and advocacy is of paramount importance, developing policies for individual sectors.

This book draws on a range of examples to illustrate how to design, implement and evaluate the integration of public health into urban management. It provides descriptions of the different project phases. Noteworthy is a list of interesting indicators for evaluation. A number of case studies is presented. There is much attention to rapid appraisal techniques and to priority setting procedures. Community participation is highlighted as crucial. The book ends with an examination of factors influencing the transformation of a project cycle into a continuous process. Illustrations are scarce, but there are many boxes with the case studies. Rather for specialists than for a wide audience. (WB)

Zeeuw, Henk de **(2002) Soil and Water Management in Agriculture Production in Urban Areas (SWAPUA) of CEE/NIS Countries - PART 1: Main report. ETC Netherlands,**
Leusden, The Netherlands INCO : International Scientific Cooperation Projects (1998-2002)
city ecology
policy development; Bulgaria; Romania; Czech Republic; Russia; Slovenia; urban agriculture; periurban agriculture; cities; stakeholders; water management; soil; Europe (Eastern)

The aim of the SWAPUA was to contribute to policy development in CEE/NIS countries regarding urban agriculture by exploring presence, benefits and risks of various types of urban and peri-urban agriculture, as well as by initiating local processes of participatory policy formulation and action planning.

The SWAPUA project was undertaken in 2 cities each of Bulgaria, Romania, Czech Republic, Russia and Slovenia and include a/o the following activities:

- A review of actual policies and programmes regarding urban agriculture in European cities

- Implementation of an exploratory household survey among different types of urban an dperiurban farmers and gardeners.

- Involvement of local stakeholders in a participatory process of problem analysis and action planning in selected urban agriculture areas in the five countries.

- The testing of the quality of soils, water and agricultural products in selected urban agriculture sites in the five countries and the implementation of a desk study on the management of heavy metals in agricultural soils.

- Description of one or two "best practices" for sustainable urban agriculture in each of the five countries.

- The organisation of a dissemination seminar in Sofia with 65 participants from 17 CEE/NIS countries.

The following results were gained:

- New insights were gained in the characteristics, problems and perspectives of the various types of urban small-scale gardeners and farmers in ten cities in five CEE/NIS countries and a new perspective on the potentials and multiple functions of urban agriculture was developed.

- Several Multi Stakeholder Platforms on Urban Agriculture were established and Action Plans on Urban Agriculture were developed.

- The results of the exploratory study and the participatory planning processes provide the basis for the formulation of a policy framework and a video on urban agriculture.

- The findings and recommendations of the project were shared with city administrations and public institutions, in the cities included in the study as well to many others through dissemination activities, which motivated them to take the subject of urban gardening on their policy agenda and ti undertake actions to support urban gardeners and small-scale farmers.